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NetworkWorld

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STRIKES
AGAIN**
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**CISCO GOES
MOBILE, PLUS
OTHER SHOW
NEWS.**

November 20, 2000 Volume 17, Number 47

The network portal: www.nwfusion.com

Hosts with the most

Web hosts started out offering simple collocation, but they're now serving an all-you-can-eat buffet of managed services.



PAGE 58

Caution flags flying as CLEC woes mount

BY MICHAEL MARTIN

A worsening shakeout in the competitive local exchange carrier market has network professionals and analysts questioning how big a role CLECs should play in corporate WANs.

The latest news rocking the

competitive local exchange carrier market includes:

- ICG Communications, which serves more than 10,000 ISP, long-haul-carrier and business customers, last week filed for Chapter 11.

- New Edge Networks of Vancouver, Wash., a wholesale DSL provider serving small,

midsize and rural markets, revealed last week that it will cut roughly 30% of its 455-person workforce.

- Earlier this month, Teligent, a Vienna, Va., wireless and wireline broadband service provider, announced plans to slash more than 20% of its workforce and

See **CLEC**, page 85

Troubled times

Disappointing financial results and increased competition have forced a growing number of CLECs to scale back rollouts and make other shifts in strategy.

Aug. 8
Verizon announces it intends to acquire a controlling interest in competitive DSL provider NorthPoint Communications.

Sept. 26
DSL provider Jato Communications says it is scrapping its national rollout strategy for financial reasons.

Nov. 1
Covad CEO Robert Knowing resigns, citing investor reaction to poorer-than-expected Q3 results.

Nov. 9
Teligent announces it will cut 780 of its 3,480 employees.

Nov. 13
New Edge says it will slash 30% of its workforce.

Nov. 14
ICG files for Chapter 11 bankruptcy protection. Trading of ICG shares on Nasdaq is halted.

2000

Sept.

Oct.

Nov.

U.S. Army kick-starts cyberwar machine

BY ELLEN MESSMER

ARLINGTON, VA. — The U.S. military has a new mission: Be ready to launch a cyberattack against potential adversaries, some of whom are stockpiling

cyberweapons.

Such an attack would likely involve launching massive distributed denial-of-service assaults, unleashing crippling computer viruses or Trojans, and jamming the enemy's computer

systems through electronic radio-frequency interference.

See **Cyberattack**, page 16



Lt. Gen Edward Anderson: The ability of the U.S. to conduct cyberwarfare "doesn't exist."

VENTURE CAPITAL SURVEY

Up-and-down quarter

BY CAROLYN DUFFY MARSAN

Venture capital funding in network start-ups declined for the first time in 18 months, dropping 13% from a record-breaking \$15 billion in the second quarter of 2000 to \$13.1 billion in the third quarter, according to the most recent PricewaterhouseCoopers/Network World Venture Capital Survey.

See **Venture Capital**, page 86.

Online:

See where VCs spent their money in Q3. DocFinder: 1841 www.nwfusion.com

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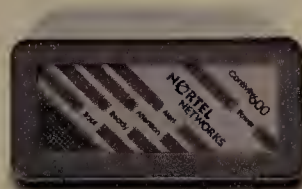


1. Rapier 24 and Rapier 48 have 24 and 48 10/100TX ports respectively. Rapier 16f has 16 100FX ports. All Rapier switches include 2 bays for optional Gigabit Ethernet uplinks. 2. Rapier 24 and Rapier 16f include a service bay for direct WAN connections. 3. Based on the Rapier 48 US List price. Prices may change without notice.

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Dell's PowerEdge 6400 is a four-way server that's long on performance but short on serviceability. **Page 67.**



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Thomas Nolle: So is optics really just hype after all? **Page 57.**

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THIS WEEK
ONLINE

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INTERACTIVE

Net.Worker

Check out our newest online-only columns that are geared toward helping teleworkers and those that manage them.

- **Teleworker Beat:** Managing Editor Toni Kistner discusses how teleworkers are only as good as the equipment they've got at their disposal. **DocFinder: 1834**
- **Home Base:** Industry expert Jeff Zbar writes on how paranoia is a good thing, even for the home worker. **DocFinder: 1835**
- **SOHO Tech Diary:** Technology Editor Mark Brownstein on the miracles of the multifunction machine. **DocFinder: 1836**

Got smarts?

Network World's Test Pilots program on Fusion allows you to submit your review of an enterprise networking product as well as to comment on your peer's product reviews. Reviewers can work their way up the Test Pilots Leaderboard and become eligible for Test Pilots regalia.

DocFinder: 1837

NEWSLETTERS

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DocFinder: 1744

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BARNEY'S RUBBLE

The best of the NetFlash daily newsletter



What makes Johnny (and Jane) write viruses?

Ever wonder what makes virus writers tick? Well, according to a woman who studied these clowns for eight years, young virus authors are stupid and older ones are simply evil.

Interviews with virus writers revealed some rather bizarre beliefs. For instance, a doofus who calls himself "Evul" writes viruses, but claims he no longer spreads them. However, Evul posts virus code on the Internet, and says it's not his fault if someone else uses the code to cause harm.

What a schmo. **DocFinder: 1844**

Wireless advertising emerges to face uncertain future

I drive about two hours a day and have seen all kinds of idiots — people reading books at 65 mph, or drinking and smoking, or weaving in and out of traffic. I've seen my share of fatalities these numbskulls cause. Perhaps the biggest threat to my personal safety is the guy reading, drinking, smoking, weaving — and talking on his cell phone, all at the same time!

Well now he might not just be checking in with his little office sweetheart. Instead he could be plowing into me because his eyes are fixed on a stinkin' little ad on his stinkin' little cell phone display. Companies such as DoubleClick are experimenting with wireless ads, and they could roll out next year in major metropolitan areas. Time for me to get a car with air bags. **DocFinder: 1845**

Virgin withdraws Webplayer Internet appliance

A few months ago we brought you a report on Virgin's Web appliance, which it was giving away to boost sales for its stores. Like most Web appliances, performance stunk and most of the coolest features of the Internet were not available. Well the company put its customers out of their misery by pulling the plug on this lame hunk of junk. **DocFinder: 1846**

— Doug Barney, executive editor, News

Sign up for this e-mail newsletter online. **DocFinder: 3850**

COLUMNISTS

Keeping Current

Baby Bells: The sequel

Fred McClimans on what's behind the BT and AT&T split-ups. **DocFinder: 1838**



Compendium

Taking 'IP everywhere' too literally

Plus: Fusion Executive Editor Adam Gaffin on women software engineers and checking the spell checker. **DocFinder: 1839**



View from The Edge

It's a serious technology if backup is needed

The Edge Managing Editor David Rohde on DSL's coming of age and the need for serious planning. **DocFinder: 1840**



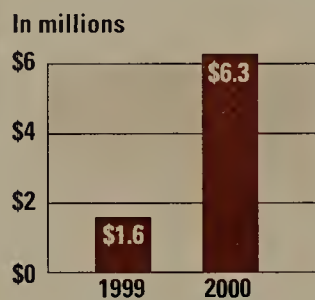
NEWS BRIEFS, NOVEMBER 20, 2000

Online holiday sales seen soaring

An estimated 6.3 million U.S. shoppers will spend more than half their holiday budgets online this year, up almost 300% over 1999, says Jupiter Research. Also, 35 million people will buy gifts online this holiday season, an increase of 75% over last year. Books, toys and music will continue to be the most popular purchases, but clothing sales are also expected to increase.

Not just browsing

New research predicts a 294% rise in shoppers spending more than half their holiday budgets online.



SOURCE: JUPITER RESEARCH

AT&T to spin off Liberty Media

AT&T last week announced it would spin off Liberty Media to comply with regulatory rules on its cable ownership. In June, the Federal Communications Commission approved AT&T's \$58 billion merger with cable television and Internet access firm MediaOne Group, provided AT&T would divest Liberty Media, sell MediaOne's stake in Time Warner Entertainment or let go of individual cable systems to diminish its market share. AT&T said it has "the option of deciding to use the spinoff of Liberty Media to comply, in large part, with one of the three conditions set forth by the FCC."

MP3.com facing another suit

Music downloading service MP3.com last week said another lawsuit has been filed against it for copyright infringement. The class action complaint was filed on behalf of music company Unity Entertainment and others by the law firm Engstrom, Lipscomb & Lack in U.S. District Court for the Central District of California in Los Angeles. The suit comes only days after MP3.com ended its long-standing battle with major record labels. Earlier in the week, the firm was ordered to pay \$53.4 million to Universal Music Group to settle charges of copyright infringement.

MP3.com CEO Michael Robertson said "on behalf of both consumers and artists, we are disappointed to receive this complaint, particularly in light of the strides we have made in securing licensing agreements from now all five of the major record labels."

Cisco buying Radiata

Cisco last week announced that it will acquire privately held Radiata, a supplier of chipsets for high-speed, 802.11a-compliant

wireless networks, for \$295 million. Radiata's chips will let Cisco develop products that operate in the unlicensed 5-GHz frequency range at speeds up to 54M bit/sec. Cisco's Aironet 340 Series line of products, which are currently shipping, are based on the IEEE 802.11b wireless standard, which operate in the unlicensed 2.4-GHz frequency range at speeds up to 11M bit/sec.

GM, Reynolds cancel engagement

General Motors and software vendor The Reynolds & Reynolds Co., of Dayton, Ohio, last week called off a deal formulated last spring that would have had GM taking a 10% stake in Reynolds, with Reynolds becoming the exclusive provider of Web-based business technology to

GM's 8,000 dealers in North America. The two firms said the deal was called off largely because of financial disagreements and how exactly to carry out last spring's memorandum of understanding.

Tallying the dot-com failures

At least 130 Internet companies have closed since January, leading to approximately 8,000 layoffs, according to a report by Webmergers.com, an Internet research site. Dot-com shutdowns were rampant in November, with 21 companies closing operations in the first half of the month, compared with 22 closings in all of October. November closings include Furniture.com, Pets.com and Garden.com. Nearly 100 of the closed businesses targeted consumers, while 26 focused on business-to-business.

That fiber optic stinks!

Nearly all office buildings have access to a sewer system, and one carrier is trying to take advantage of that ubiquity. CityNet Telecommunications in Silver Spring, Md., is deploying dark fiber in municipal sewer systems as an alternative to digging up city streets. CityNet is building minifiber rings in cities such as Omaha, Neb., and Albuquerque, N.M., that connect 30 to 60 office buildings. CityNet uses specialized robots called Sewer Access Modules from Ka-Te Robotics to install stainless steel alloy rings to hold the fiber.

The company is in discussions with 15 to 20 other cities to deploy its dark-fiber rings. CityNet expects to deploy its sewer fiber systems in Indianapolis and Washington, D.C., next.

More users cite Verizon capacity problems

Bell may control situation by next year.

BY MICHAEL MARTIN

Verizon's intercentral office fiber shortage in parts of Massachusetts, described in last week's issue (www.nwfusion.com, DocFinder: 1848), appears to be affecting more than the two customers described in the original story.

One reader sent an e-mail saying his company should be added to the list of businesses waiting months for frame relay service. Another described a situation almost identical to the one in the original story.

Millipore, a Bedford, Mass., maker of purification products, won't be able to upgrade the frame relay network that connects its headquarters to its international branch offices until next year.

Millipore ordered T-1 lines from Sprint in July, says Keith White, senior communications engineer with Millipore. The lines originally were scheduled to be installed in September but were delayed because of the Verizon strike.

After the strike, the installation dates were set back again.

"Suddenly the two-week strike turned into a two-month backlog, which seemed strange," White says.

Finally in October, after multiple calls to Sprint, White says he was told "unofficially" that Verizon had run out of capacity and Millipore wouldn't be getting its new T-1s until 2001.

"No one has ever actually stated when we'll be getting them," White says. "They won't give us a precise date."

Millipore is getting by on its existing frame relay lines, but the company is in the process of moving to an Oracle 11i database, which will require more bandwidth for those tapping into it.

White expects the move to the new database will cause capacity problems.

White says Millipore is investigating the possibility of using broadband wireless technology from Teligent to increase its bandwidth.

"It's an interesting idea to try to get around Verizon," he says.

Unprecedented demand

Verizon spokesman Jack Hoey says the provider is aware of problems only with the two companies cited in last week's *Network World* story. But he adds he wouldn't be surprised if there were more cases.

"It's all connected to unprecedented demand for high-speed access of all kinds," he says. "In the last 22 months, we've built as much interoffice fiber as we'd built in the previous 100 years."

Hoey says Verizon should have the shortage under control by early next year.

Verizon wasn't the only carrier that received reader criticism.

One West Coast reader said that waiting a few months for a T-1 doesn't seem too horrible to him — because he's waiting until 2002 for a T-3 line. ▀

Call on more RBOC-related stories on page 36.

Be a
Net Know-It-All
For the answer to this week's question and more net trivia, visit **Network World Fusion** and enter **2349** in the Search box.

This week's question:

What's the name of the new online organization formed by healthcare firms Aetna, Cigna, PacifiCare and others?

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Intel pulling back from selling NetStructure brand

After taking heat from OEM partners, Intel decides to funnel products through them.

BY APRIL JACOBS

Intel will phase out direct sales of its NetStructure e-commerce and network infrastructure products in favor of funneling those wares through OEMs, some of which had bristled at Intel's short-lived attempt to compete with companies that it also supplies.

"It doesn't make sense for them to compete with their own customers," says Humberto Andrade, an analyst at Business Technology Research. "This [product line] is not their core competency."

Andrade thinks users might hesitate to place orders while the transition takes place, asking: "Would you buy a brand that's going to disappear in six months?"

Intel's NetStructure line

Playing nice

Intel plans to phase out direct sales of NetStructure to end users in favor of selling to OEMs.

Product:	Description:	Competition:
Intel NetStructure 1520 Cache	Cache appliance for T-1 environments.	CacheFlow, StrataCache, Sun
Intel NetStructure 7115 e-Commerce Accelerator	Boosts the speed of e-commerce traffic by off-loading the encryption and decryption of secure Internet transactions. Performs all Secure Sockets Layer processing, freeing Web server resources.	CyberIQ, CacheFlow, F5
Intel NetStructure 7185 e-Commerce Director	Combines security acceleration and content-aware traffic management.	Nortel Networks, Cisco, F5
Intel NetStructure 7145 Traffic Director	Helps improve Web site responsiveness and reduce errors.	Nortel Networks, Cisco, F5

includes many products, such as cache and secure transaction processing devices meant to off-load tasks from Web server farms to switches, routers and Web hosting appliances.

Current users don't appear to be balking at the move, which analysts say shouldn't present a problem as long as Intel continues to support products already sold and makes good on orders. Intel

spokeswoman Amy Hamilton says the company will do both.

Mahesh Muchhala is CEO of CertifiedMail, a secure messaging software and hardware provider that integrates its

offerings with Intel's secure transaction-processing device. Muchhala says CertifiedMail, an Intel customer that provides its own software bundled with Intel devices to end users, isn't worried about Intel's decision.

But others were less certain. One end user interviewed for this story was caught off guard by the news, despite getting a visit from Intel just a few weeks ago.

"Whether users will be perturbed is still a question. Intel's reputation for support will be the guide," says Summit Strategies analyst Warren Wilson.

Hamilton says Intel's decision to change from selling NetStructure direct and through channel partners to OEMs will bring the company back to its traditional roots.

"Intel has this model for a lot of their other divisions," she says, adding that when Intel introduced NetStructure earlier this year, there were far fewer players in the market.

It's that competition that may be bringing Intel some measure of friction in walking the line between supplier and direct seller.

Trying to be both has almost never worked in the industry. For example, Compaq bowed to the pressure of channel partners and softened a direct sales model a few years ago.

Intel may have found itself in a similar spot with competition for its NetStructure products coming from Nortel, Cisco, Sun, F5, CacheFlow, CyberIQ, and others. ■

Tivoli touts virtual storage pool that can be shared

Storage Tank extends data reach across all hosts and storage.

BY DENI CONNOR

AUSTIN, TEXAS — Tivoli Systems rolled out a storage technology last week that lets network professionals share data among different host systems by building pools of storage that can be allocated by application, business need or degree of fault tolerance.

Code-named Storage Tank, the software ties any Unix, Windows NT or 2000, or Linux host to any storage system via traditional storage-area network switches to create a single virtual pool of data that can be shared by any host, user or application.

The technology is one of the first that treats data in an agnostic manner irrespective of the server file system and creates virtual pools of storage that can be assigned to different applications, class of user or importance of data. For instance, Network Appliance blends the Network File System used in Unix systems with

the Common Internet File System used in NT and Win 2000, but does not apply attributes to the data that lets IT managers set policies. Other vendors, such as Compaq and EMC, add data to a common storage pool that is assigned to a single server.

"These vendors give you the ability to take disparate storage, pool it, and let you slice it and dice it and make it available to server A, B or C," says Steve Duplessie, analyst with Enterprise Storage Group. "But they stop short of [Tivoli's Storage Tank's] approach, which gives you additional attributes to create policy on."

For instance, IT managers might want to create three storage groups — a group for very important data, less-important data and data that is not at all mission-critical. Then they might want to put their very important Oracle database data on an IBM Shark Storage array, their less-important data on a Compaq Stor-

ageWorks array and the remaining data on a just a bunch of disks (JBOD). The mission-critical Oracle e-commerce application running on NT would be stored on the IBM storage array and saved continuously with snapshot backups. Solaris or Linux servers could access the Shark and retrieve data for a data-warehousing site running Win 2000 and save the data to the Compaq StorageWorks array, which is backed up incrementally each day. At some time, when the data becomes less frequently used, it will be stored on the JBOD.

Also included in Storage Tank is the ability to set policies that control the migration of old data from one storage device to another or that could indicate where a certain type of data should be stored. Policies can let IT managers enforce service-level agreements.

Storage Tank is the culmination of eight years of develop-

ment within IBM Research and Tivoli, and is based on technology that has only been available in high-end mainframe environments.

Tivoli will provide a developers' kit for operating system vendors that want their platforms to work with Storage Tank, and a program for application and database vendors that lets them certify their products with Storage Tank.

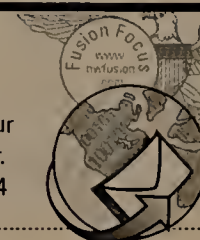
Dataquest says storage management technology will increase from about \$740 million in 2000 to nearly \$1.7 billion in 2004.

Tivoli will ship Storage Tank the second half of next year. Pricing is not available.

Tivoli: www.tivoli.com

Storage

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Nortel sets VPN sights on smaller sites

Although company still lacks low-cost VPN box for individual telecommuters.

BY TIM GREENE

BOSTON — Nortel Networks is introducing two boxes that make it more affordable to hook smaller sites to corporate VPNs.

The Contivity 100 and 600 devices are designed for remote offices with less than 30 users connected to a VPN via dial-up or dedicated links.

Previously, Contivity users were limited to larger switches, which have too much capacity and are too expensive for small offices. The alternative for these customers was to connect individual PCs at remote sites to their VPNs using Contivity software, but that could be an administrative hassle. Also, remote PCs had to make their own dial-up connections rather than sharing a link.

With Contivity 100, customers can provide a five-user office with access to a VPN using a single Internet connection. The device comes with an Ethernet connection to tie to an



Nortel's Contivity 600 supports up to 30 simultaneous VPN tunnels.

external DSL, ISDN or analog modem to connect to the Internet. Customers can also buy the device, which performs Triple-DES encryption at 3M bit/sec, with optional built-in modems. This is similar to VPN gear made by Indus River, Intel and NetScreen.

The Contivity 600 must use an external modem or router to connect to the Internet, but a model with integrated WAN ports is on the drawing board. The product handles 30 simultaneous tunnels and performs Triple-DES encryption at 10M bit/sec. Nortel says this will compete with Cisco's 3000

series and 1700 router.

Nortel still lacks a low-end, \$500 box that companies could use to support telecommuters who now rely on PC software clients, says Jeff Wilson, an analyst with Infonetix. Such appliances would support dedicated connections such as DSL, and network administrators could preconfigure them to avoid end-user changes, he says.

In addition, such appliances would handle VPN processing, off-loading the burden from a PC's CPU. Nortel says it has no short-term plans to build such devices.

Nortel is also switching out the firewall that comes with Contivity equipment. The company is ditching Check Point's Firewall-1 in its VPN products in favor of a firewall built by Nortel itself. Nortel says this streamlines management because its VPN platform can also manage its firewall. Check Point's management program was separate.

Contivity equipment will now also support Open Shortest Path First (OSPF) and Virtual Router Redundancy Protocol (VRRP). OSPF will enable faster rerouting times when VPN links fail, and VRRP will let customers pair Contivity equipment at a site for failover purposes.

These features are aimed at companies that use site-to-site VPNs as the primary connection between offices.

New software also enables the Contivity equipment to dedicate bandwidth to certain users or classes of users.

The Contivity 100 costs \$1,000 without built-in WAN hardware. With DSL, ISDN or analog WAN ports built in, the price ranges up to \$1,400. The Contivity 600 costs \$2,400 for the base model. It costs \$500 more for a firewall and \$1,000 more for advanced routing capabilities.

Nortel Networks: www.nortel.com

3Com buys its way into Gigabit Ethernet NIC market

BY PHIL HOCHMUTH

The purchase of Alteon Web-Systems' Gigabit Ethernet adapter business last week by 3Com will instantly make the latter a player in the Gigabit network interface card market.

But one analyst is puzzled why the leader in NIC technology had to purchase its way into a hot network connectivity market.

3Com purchased the physical assets of Alteon's NIC business for \$110 million, and will license Alteon's NIC technology patents from Nortel Networks, which acquired Alteon for \$7.8 billion last month. The deal is expected to close at year-end.

The deal would put 3Com in second place in the Gigabit Ethernet NIC market, with 3Com absorbing Alteon's 34.2% share of 1000M bit/sec NICs shipped in the second quarter, according to Cahners In-Stat Group. 3Com recently introduced its own copper-based Gigabit NIC.

Alteon was the first company to offer copper-based Gigabit Ethernet adapters for servers, with the introduction of its ACEnic products a year ago.

In addition to market presence, the acquisition gives 3Com technologies to add new functionality to future products, says Tom Werner, a 3Com vice president.

"We think this acquisition lays the foundation for us to drive the transition from 10/100M bit/sec to Gigabit Ethernet" in corporate networks, he says.

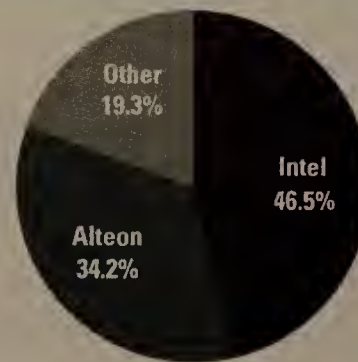
Alteon's NIC technology, such as onboard Reduced Instruction Set Computing processors, will be integrated with features in 3Com's Etherlink adapters, such as encryption off-loading and management, Werner says.

Products are planned for release in the second half of 2001. The combination of the Alteon and 3Com NIC architectures could yield features such as NIC-

Taking Alteon's place
By acquiring Alteon's NIC business, 3Com will become No. 2 in the 1000M bit/sec adapter market.

Gigabit Ethernet adapter market share for Q2. Based on a total of 69,000 units shipped.

SOURCE: CAHNERS IN-STAT GROUP



level traffic prioritization and the encryption and transmission of packets at wire speed.

Mike Wolf, an analyst with Cahners In-Stat Group, says he is surprised by the amount of time it took 3Com to develop its own 1000Base-T NIC and that it bought its way into a leadership position in the Gigabit Ethernet NIC market.

"3Com, which is basically the top NIC company, had never done a Gigabit NIC product on their own" until recently, Wolf says, "whereas Intel had been in

this market for a couple years"

Alteon is a wholly-owned subsidiary of Nortel. The telecommunications giant bought Alteon for its Layer 7 Web switching technology and to keep in step with Cisco, which had purchased Layer 7 vendor ArrowPoint Communications earlier in the year.

With Alteon's Web switching technology now a focus of Nortel, divesting the NIC business was a logical step, says Ed Roseberry, director of Alteon's NIC business. ■

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Cisco's offers on-the-go broadband VPN access

BY PHIL HOCHMUTH

LAS VEGAS — Cisco last week announced its Internet Mobile Office program aimed at giving corporate road warriors secure broadband access to enterprise network applications while on the go.

The program, launched at Comdex Fall 2000 in Las Vegas, includes a series of partnerships with service providers and network integration firms that will install Cisco wireless and wired network equipment in public venues such as Hilton hotels, convention halls, airports and Starbucks coffee shops.

IPass' Global Broadband Roaming Service, which pro-

COMDEX
FALL 2000

vides pay-as-you-go, high-speed VPN access from public venues, also was announced. IPass is a large ISP consortium that provides worldwide Internet access-roaming services.

On the road, business travelers use a laptop with Cisco's Secure VPN client software and an Aironet wireless LAN PC card to access the Internet or a corporate VPN.

Mobile access service can be purchased from any Cisco partner service provider, from which businesses would receive one bill for an employ-

ee's roaming broadband charges even if services from other provider partners are used.

CAISSoft billing settlement software, acquired by Cisco last month from CAIS Internet, is used to organize charges from multiple service providers into a single bill.

Travelers accessing e-mail and the Web at airports, hotels and convention centers usually must pay a fee for each access, says Ron Willis, a Cisco vice president.

This can get unwieldy and expensive for corporations with a large workforce of road warriors.

"In one day, you could have paid four or five charges of \$10

to \$15 each," Willis says. "Companies want reasonable charges for this kind of access, and a single bill at the end of the month."

Cisco is partnering with several service providers, including Global Digital Media, MobileStar and Wayport, which provide Internet services to the hotel and hospitality industries.

Also involved in the initiative are system integrators Electronic Data Systems and Concourse

Communications Group, which will install Cisco-based VPNs and wireless technologies.

Mobile access service, which includes the Cisco VPN client, can be purchased from any Cisco partner for prices starting at \$40 per month. Cisco Aironet wireless LAN cards cost about \$250, and the client soft-

ware to run the cards is available from Cisco's partners.

Cisco: www.cisco.com/go/mobileoffice.

Hitting the online road

Of the work done on the road by U.S. business travelers, 62% involves accessing the Internet or a corporate LAN remotely.

SOURCE: JUPITER COMMUNICATIONS

Comdex roundup: from Microsoft's .Net to political commentary

Last week's Comdex Fall 2000 conference served as the stage for a slew of announcements from large and small companies focused on tech-

COMDEX
FALL 2000

nologies from wireless Internet access to voice-enabled browsers. And naturally, attendees couldn't avoid election talk. Here is a sampling of the highlights:

Microsoft pushes .Net

Microsoft rolled out the first beta version of Visual Studio .Net and its .Net framework. The betas are important milestones for getting developers behind Microsoft's .Net, a broad initiative designed to allow software to run on the Internet and be accessed by any number of devices.

The software giant also submitted its new C# programming language, an object-oriented language designed for building distributed .Net applications, and its Common Language Infrastructure to the European Computers Manufacturers Association, an international standards body. C#

(pronounced "C sharp") is a key component of Visual Studio .Net.

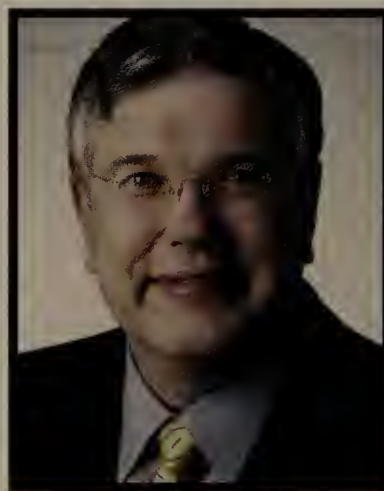
McAfee.com backs .Net, too

Microsoft wasn't alone in promoting .Net. McAfee.com unveiled a three-pronged .Net strategy that involves productivity, security and help desk services that customers can sign up for by paying monthly subscription fees. The company's productivity application service will center on a set of office applications modeled after Word, Excel and other Microsoft programs, and cost \$50 per user per year. The security service will consist of new and existing McAfee.com technologies for fighting viruses and providing firewall capabilities. The help desk offering provides further antivirus support and helps companies recover from data losses. The security and help desk services cost \$70 per year each.

Palm delivers on promise

Palm CEO Carl Yankowski last week introduced a wireless Internet access kit and service for his company's devices, fulfilling a promise he made a year ago to enable all nine million Palms in use to access the .Net wirelessly. For the Palm

M100, III and V models, the company is introducing its Palm Mobile Internet Kit (the Palm VII includes built-in wireless capabilities). The kit, which includes an upgrade to the Palm OS 3.5, will require the use of a cellular phone and will cost \$40. The Internet service, called MyPalm.net, will



Palm CEO Carl Yankowski unveiled wireless Internet access for all Palm devices.

let users wirelessly download programs, update calendars, shop for products and gain access to news and other information. The service will launch Dec. 25.

Election is talk of Vegas

The delayed result in the U.S. presidential election gave

the heads of Microsoft, Oracle and Hewlett-Packard material to lighten up their presentations at the conference.

Microsoft Chairman Bill Gates described the results delay as "not the best use of technology" and said the problems with the punch card ballots in Florida reminded him of the days when punch cards were the entry medium for early computers — a remark that drew groans and chuckles from audience members.

Oracle CEO Larry Ellison, describing himself as tending "not to be political," said he'd like to see the current president stay in place. "I hope they can amend the [U.S.] Constitution to let Bill Clinton run again," he said.

HP CEO Carly Fiorina, referring to unexpectedly poor fourth-quarter financial results, quipped: "Don't we get a recount too?"

Talking to the Web

One Voice Technologies demonstrated an on-screen mascot called IVAN (intelligent voice-animated navigator) that responds to an end user's spoken commands to search for information on the Internet based on more than 100,000 concepts. IVAN,



which looks like a small globe with a face, arms and legs, retrieves information on Web sites and prioritizes them based on licensing deals that One Voice has signed with various sites. IVAN is part of free client software that One Voice makes available at www.myivan.com.

Letting companies YAP over IP

Net2Phone announced the YAP (Your Alternative Phone) Max 16 and YAP Max T-1, voice-over-IP appliances that can be plugged into a legacy PBX to let end users make phone calls and send faxes over the Internet. Calls made between offices with YAP products installed are free. The YAP Max 16 lets up to 16 users make Internet calls or faxes at once. The YAP Max T-1 allows up to 30 simultaneous voice-over-IP calls or faxes.

The YAP Max 16 costs \$4,250, and the YAP Max T-1 costs \$6000.

Compiled by IDG News Service and Network World staff.

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Oracle repackages advanced queries, data mining inside 9i

BY JOHN COX

REDWOOD SHORES, CALIF. — Oracle this week will bolster its upcoming 9i database with the announcement that it will meld three once-separate server programs for data warehouse and business intelligence applications into a strategic data storehouse.

The change eliminates the need for users to deploy and maintain separate products and reduces the labor needed to make the applications work together. This extension of Oracle's flagship database is part of Oracle's plan to make 9i the linchpin of corporate e-commerce sites.

Relational database vendors usually offer separate server products for online analytical processing (OLAP), which can run complex "what-ifs" and similar queries against lots of data. Other products handle data mining, which uses algorithms to sift through data packed into huge data warehouses, search-

ing for patterns or predicting trends. Similarly, building data warehouses, which collect data from inventory, billing and other production-relational databases, requires separate servers to move, convert and load the data. Until now, this was also Oracle's approach.

Oracle engineers have dismantled three acquired products, Express, Darwin and Pure Integrate and rebuilt their elements inside the database so they use the underlying Oracle 9i data manager. Oracle Express was the multidimensional database for OLAP queries, Darwin was the data mining server and Pure Integrate was used for data warehouse extraction, loading and transformation (ELT). In 9i, these become OLAP, data mining and ELT services. The database will run on many Unix and Windows NT/2000 servers, and IBM S/390 mainframes.

Some Oracle extensions to SQL, which is used to access relational data, lets existing SQL applications and tools easily access the new features, says Jagdish Mirani, an Oracle marketing executive.

Oracle says a new release, 3i, of Oracle Warehouse Builder (OWB) will be included with 9i. OWB is a tool set for setting up a data warehouse and, especially, for managing metadata.

Also new are a set of Enterprise Java Beans, dubbed Oracle BI Beans, that use a new Java API created for business intelligence queries. Pricing for BI Beans will be released next spring.

That's also the target date for the release of Oracle 9i, and the accompanying release of OWB. Final packaging and pricing have not yet been set.

Oracle: www.oracle.com

Cyberattack,
continued from page 1

An order from the National Command Authority — backed by President Clinton and Secretary of Defense William Cohen — recently instructed the military to gear up to wage cyberwar.

The ability of the U.S. to conduct such warfare "doesn't exist today," according to a top Army official speaking at a conference in Arlington, Va., last week.

"We see three emerging threats: ballistic missiles, cyberwarfare and space control," said Lt. Gen. Edward Anderson, deputy commander in chief at U.S. Space Command, which was recently assigned the task of creating a cyberattack strategy. "Cyberwarfare is what we might think of as attacks against digital ones and zeros."

Anderson spoke about the Space Command's cyberwarfare responsibilities at the National Strategies and Capabilities for a Changing World conference. The event was organized by the Institute for Foreign Policy Analysis, Tufts University's Fletcher School of Law and Diplomacy and the U.S. Army. The conference attracted military top brass and international diplomats.

Anderson told attendees that the U.S. Space Command, the agency in charge of satellite communications, has begun to craft a computer network attack strategy. This strategy would detail actions to be followed by the Unified Commanders in Chief (CINC) if the president and the secretary of defense order a cyber strike. The CINCs are senior commanders in the Army, Navy, Air Force and Marines deploying U.S. forces around the world.

The information-warfare strategy will be detailed in a defense plan called "OPLAN 3600" that Anderson said will require "unprecedented cooperation with commercial enter-

prises and other organizations."

There's no set deadline for completing OPLAN 3600, Anderson told *Network World*. But he noted that other countries, including Russia, Israel and China, are further along in building their information-warfare capabilities.

Anderson said the U.S. may end up with a new type of weaponry for launching massive distributed denial-of-service attacks and computer viruses. "The Chinese recently indicated they are already moving along with this," he added.

In addition to the possibility of cybercombat between nations, the military acknowledges that terrorists without the backing of any country can potentially use cyberweapons to disrupt U.S. telecommunications or banking systems that are largely electronic.

That's one reason the U.S. Space Command is joining with the FBI to build an information-warfare strategy.

"This requires a close relationship between military and law enforcement," said Michael Vatis, an FBI official who also spoke at the conference. He noted that the FBI will have to help determine if any cyberattack suffered by U.S. military or business entities calls for a military or law enforcement response.

"The Internet is ubiquitous. It allows attacks from anywhere in the world. Attackers can loop in from many different Internet providers," said Vatis, who noted that a cyberattack can include espionage using computer networks.

"It could start across the street but appear to be coming from China. And something that might look like a hacker attack could be the beginning of cyberwarfare," he added.

Vatis said the growing bullets-and-guns conflict in the Middle East between Israel and the Palestinians, with Islamic supporters elsewhere, is being accompanied by cyberattacks from each side against the other. It's serious enough, he said, that the FBI issued an alert about it to the U.S. Space Command, giving U.S. forces warning that the action on the cyber front could affect them, too. ■

PSINet weighs options

BY CLARE HANEY

ASHBURN, VA. — PSINet last week said it is working with investment bank Goldman Sachs to determine how the struggling ISP should proceed with its business. Possible future directions include a complete or partial sell-off of its operations, the ISP said. PSINet's board of directors has formed a committee to consider options for the future and to work alongside Goldman Sachs.

The ISP may also choose to seek a strategic alliance as a way to improve its valuation, PSINet said. "We remain committed to maximizing shareholder value and believe that a review of all our options as we move forward is appropriate," says Bill Schrader, the company's CEO.

PSINet grew rapidly over the past few years, making scads of ISP acquisitions worldwide. But the downturn in the dot-com market hit the company hard. Earlier this month, PSINet



PSINet CEO Bill Schrader says the company is exploring its options, maybe even its sale.

declared a third-quarter financial loss of \$1.4 billion. At the same time, it unveiled a restructuring plan that calls for it to offload the bulk of the e-business and IT service operations obtained through its March purchase of Metamor Worldwide. The firm's share price closed Thursday at \$2, down from a 52-week high just under \$61.

Haney is a correspondent with the IDG News Service's San Francisco bureau.

Corrections

The story "Executives debate SAN construction," (Nov. 13, page 19) misidentified two executives. Mike Hogan and Bill Peldzus work for Imation.

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Wired Windows . Dave Kearns

Infrastructure

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Last week, in Business Week Online, investment columnist Sam Jaffe talked about Microsoft and its stock price. As long as he stuck to traditional

business page information (the antitrust suit, the general state of the stock market) he was, I guess, fairly accurate. Jaffe got in over his head, though, in

trying to talk about Windows 2000 ("To put it bluntly, Microsoft goes where Windows 2000 goes," according to Jaffe) and especially when talking

about Active Directory.

It's confusing enough that Jaffe talks about Win 2000 as a "program," but he then goes on to say that many corporate customers are slow to migrate to it because of "numerous news reports of the software being bug-ridden and unstable." Actually, Win 2000 is the most stable operating system from Microsoft since DOS 3.1. Jaffe, though, relies on a quote from Eric Raymond, who is the guru of Open Source and sworn enemy of Bill Gates.

Jaffe really gets into deep stuff when he comments on directory services, which he calls "one of the trickiest features in the new operating system" (well, he got that right!). He calls Active Directory Service (ADS) a "feature" that "allows a central administrator to control the network" instead of what he calls the traditional, decentralized method. Jaffe does credit Novell with introducing the modern directory service, but he blithely claims "It wasn't part of an operating system."

He then goes on to state that "Corporate IT managers groaned at the concept of a built-in directory," which simply flies in the face of the information that I've collected from you as well as the information available to Microsoft and Novell.

Jaffe appears to rely on information supplied by Michael Stanek, an analyst with Lehman Brothers who predicts that "two-thirds of Windows 2000 installations in 2001 will be done without ADS." Of course, if you lump together Win 2000 Professional and Win 2000 Server installations, it's quite possible that only one-third will have ADS installed, because it's only installed on servers.

Your life gets harder when business people (and lawyers) start talking about technology as if they understand it. Hopefully, forewarned is forearmed, and you'll be ready when your boss starts spouting off about that new Win 2000 program and its centralized management.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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*Kevin Torf, Chairman and Founder
Tornado Development Inc.*



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Carriers & ISPs

The Internet, Extranets, Interexchange
and Local Carriers, Wireless, Regulatory Affairs

Briefs

Global Internet services provider **Teleglobe** last week revealed plans to set up a worldwide Internet Data Center initiative next year. The effort includes content and hosting services in seven cities worldwide and a partnership with **Cap Gemini Ernst & Young**. Teleglobe plans to develop 400,000 square feet in Frankfurt, London, San Francisco, Miami, New York, Washington, D.C., Toronto and Tokyo for the centers, which will offer services to application service providers, ISPs and carriers. Additionally, Teleglobe intends to build more than 200,000 square feet of collocation space in 33 major markets by the second quarter of next year.

James Travers, who led e-commerce company **Harbinger** through an initial public offering, revenue growth from \$25 million to more than \$200 million and a \$1.3 billion merger with **Peregrine Systems**, has joined **Agillion** as president and CEO. Travers will join co-founders **Steve Papermaster** and **Frank Moss** to lead the application service provider as it markets **CustomerPages**, Agillion's two-way, Web-based customer management product.

North American DSL lines surged past the two million mark in the third quarter, according to telecommunications consultancy **TeleChoice**. The U.S. market accounted for 1.7 million of the lines deployed. Incumbent local exchange carriers (ILEC) serviced about 75% of the U.S. total, competitive local exchange carriers about 23% and interexchange carriers about 1%. Bell South led in ILEC market growth, increasing its DSL subscriber base by 81%. The U.S. line total grew by about 520,000 lines in the third quarter. TeleChoice: www.telechoice.com

WorldCom already selling Digex services

BY DENISE PAPPALARDO

WorldCom's \$6 billion acquisition of Intermedia has not been finalized, but the deal's crown jewel — managed Web hosting services from Intermedia's Digex affiliate — is already bolstering WorldCom's product lineup.

Intermedia is the majority shareholder in Digex, which itself was the main attraction behind WorldCom's Intermedia buy, according to the company.

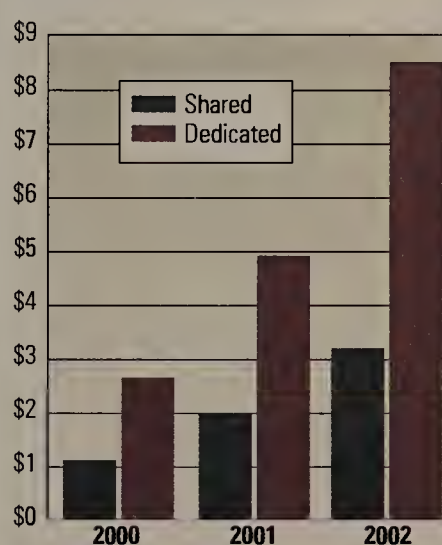
When the deal is final, WorldCom will be the majority shareholder in Digex, although the second-largest telecommunications company isn't waiting for that approval to start selling services. WorldCom sales representatives are already selling Digex dedicated managed Web hosting services to midsize and large corporate users. The services, which will be sold under WorldCom's brand name, include Unix and Windows NT managed Web hosting, e-commerce and intelligent network services such as load balancing and caching.

WorldCom is looking to grab some Web hosting market revenue, which consulting and research firm IDC predicts will total

Digex helps WorldCom in hot market

WorldCom is expanding its Web hosting services by adding Digex's offerings. IDC predicts that by the end of next year, users will triple their spending on dedicated Web hosting services, Digex's specialty, compared with shared Web hosting services.

In billions



more than \$11 billion by the end of 2002. WorldCom is competing with the likes of Exodus Communication with its managed and complex Web hosting services, and with Verio on the low end with its shared Web hosting offerings.

WorldCom customers will have more choices with its managed Web hosting services, but there is more to WorldCom's pre-emptive Digex integration.

"This is a sneak preview of how it's going to be once the merger goes through," says Melanie Posey, a senior analyst at IDC. "The point of this whole thing is to show that WorldCom is following through on its restructuring announcement. Web hosting is one of the areas WorldCom highlighted for future development, and here they are trying to make good on that promise."

Digex is also making UUNET, WorldCom's ISP subsidiary, its primary network provider. Digex is upgrading five data centers with dual OC-12 connections to UUNET's Internet backbone by year-end. Early next year, Digex will upgrade its data center connectivity to dual OC-48, says Todd Carlson, senior vice president of business operations.

See **WorldCom**, page 32

Cable technology to offer dedicated 40M bit/sec

BY MICHAEL MARTIN

AUSTIN, TEXAS — Everest Connections, a St. Louis communications provider, is planning trials of a cable technology capable of offering 40M bit/sec at DSL and cable modem prices. The trials will begin next year in the Kansas City, Mo., area.

Known as Ultraband, the technology was developed by Advent Networks in Austin, Texas, and runs over hybrid fiber coaxial networks. Unlike cable modems, which must share bandwidth with other cable modems attached to a certain cable branch, Ultraband uses switched Ethernet over cable, creating virtual channels for each user, so users get guaranteed performance.

"The existing cable modem technology is fine for basic data and e-mail," says Geoffrey Tudor, Advent's CEO. "We're going to allow more revenue-intensive services that would let service providers make a profit."

Because Advent is offering dedicated bandwidth sets Ultraband apart from tradi-

tional cable modem technology, says Adam Guglielmo, an analyst with consultancy TeleChoice. "Basically, everyone will have a VPN on the network," he says.

The speedsAdvent is offering may seem like a lot, Guglielmo says, but he expects that over the next year users will demand more bandwidth. "It's probably a little ways out before there's big demand for this kind of bandwidth," he says. "But I think Advent would say they're building this for networks of the future."

Everest is slated to begin offering Ultraband services in 2001. Ultraband will be available to other service providers in the second half of 2001, Tudor says.

Applications businesses might run over Ultraband include video and packet telephony, Tudor says. With the bandwidth Ultraband serves, Tudor thinks IT outsourcing firms could use the technology to link clients back to a central site, where the outsourcer could perform tasks such as remote storage-area network backup.

While providers will roll out Ultraband

as a residential service, Tudor says the technology will appeal to small and midsize businesses that can't afford a T-1. Because Ultraband uses the same basic infrastructure as broadband cable service and also requires a modemlike box on the customer site, its cost should be comparable to cable modem or DSL service, Tudor says.

Advent: www.adventnetworks.com

www.nwfusion.com

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Eye on the carriers . David Rohde

STEPPING OUT AFTER THE CLEC TORNADO

Here's a tricky scenario for a network manager: You have some contract flexibility to try alternative local carriers. One of your branch offices

knows of a competitive local exchange carrier in its area with real fiber in the ground, a full suite of services and competitive, obliging salespeople with that

hungry look in their eye. There's just one problem: Its stock is in the toilet.

Do you take a chance?

Some recently hammered CLECs say they're not taking the collapse in their stock prices lying down and want you to know they're open for business. One is E-spire Communications, a carrier with 38 local networks largely in mid-size cities in the mid-Atlantic, Southeast, Midwest and Southwest — and a recent stock price of \$2 per share to show for it.

A visit to E-spire's headquarters near Washington Dulles Airport certainly doesn't yield this column's periodically expressed impression of some CLECs as a bound business plan, some junk bonds and a few guys who used to work at MCI. E-spire's new management boasts a passel of executives with 15 to 30 years of experience who came over from Omnipoint, plus line people who've developed fast-packet, voice and DSL services for everyone from Bell Atlantic to AT&T and Comsat to Qwest Communications. In fact, E-spire built out much of its 3,900 local route-miles before many venture capitalists even knew what a CLEC was.

So what went wrong?

Executives admit they had problems with their billing system from Lucent unit Kenan Systems, which they say are fixed. They put traditional Lucent central office switches in their markets but targeted smaller businesses with largely me-too telephony services. They have an intercity ATM network but didn't use it to its full extent, failing to integrate E-spire's own voice and data traffic and paying wholesale long-distance fees to other carriers.

And oddly for a company with its name, E-spire never really established any compelling e-commerce services beyond an acquired hosting business in Florida called CyberGate that largely targets low-rent, shared hosting businesses.

What's the way out? CyberGate is for sale for \$100 million to \$150 million. (When Chief Financial Officer Brad Sparks sees me write that down, he jokingly asks me to raise the range another \$50 million.) E-spire is now going after data-savvy midmarket customers with NxT-1 service running over the ATM net.

It's cutting out wasted dollars paid to other carriers via better aggregation on the trunk side and auditing of accounts to cancel unused circuits.

It's not replacing its Lucent central office switches with cheap next-generation softswitches — officials allege other CLECs have had problems with softswitches — but the company is implementing so-called Primary Rate Interface "off-load" modules to take Internet dial-up traffic off the circuit network.

It's reselling Covad symmetric DSL and ISDN DSL service, and preparing more IP and hosting partnerships. And the company has an angel that has come along to invest more than \$100 million in preferred stock.

The CLEC capital crunch means E-spire's construction unit still can't build fiber everywhere it wants. But operating losses have shrunk this year, and E-spire says it's on the way back. We'll check in periodically to see how it's doing, with Wall Street and end users.

Rohde is managing editor of The Edge section of Network World. He can be reached at drohde@nww.com.

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The screenshot shows the e-Business World website. At the top is the UNISYS logo with the tagline "We eat, sleep and drink this stuff." Below it is the e-Business World logo and a navigation bar with links like TOP STORIES, PULSE, MARKETS, BACKEND, BEST PRACTICE, and YOUR MONEY. The main content area features a "Top Stories" section for Thursday, August 3, with headlines such as "AT&T, HP team up for e-commerce offerings" and "UPDATE: IBM, Vionette form e-business alliance". There is also a "Search" section with "e-business search" and "Advanced Search" buttons. A "WHAT DO YOU THINK?" poll is visible at the bottom left, asking about giving personal information on e-commerce sites.

www.e-businessworld.com



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WorldCom,
continued from page 31

Digex had a few connections to UUNET's network, but those were secondary connections, Carlson says.

When asked if Digex will use Intermedia's network for any of its connectivity needs, Carlson says "that remains to be seen."

Next year, Digex will expand its data center coverage by using some new and expanded WorldCom data centers around the world. WorldCom is investing \$1.2 billion to fuel its data center construction. Digex will share space in WorldCom data centers in Atlanta, Boston, Dallas, Denver, Houston, Los Angeles, Miami, New York, northern New Jersey, northern Virginia, San Jose, St. Louis and Washington, D.C.

Digex has one data center in London and will also share space with WorldCom in additional, unspecified interna-

tional cities next year.

Digex should need the extra space with WorldCom salespeople offering business users Digex services.

Digex only has 130 salespeople, and WorldCom has 5,500 in the U.S. and 2,000 overseas. But after WorldCom sells the service, it's entirely up to Digex to manage and support those customers. Digex says it's equipped to support tens of thousands of servers based on the company's automated systems and setup procedures.

WorldCom will likely sell all Intermedia assets that are not connected with Digex once the deal is final, but WorldCom executives would not comment on exactly what they plan to off-load. ▀

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Those Baby Bells are growing up fast

BY TIM GREENE

Regional Bell operating companies aren't what they used to be.

For one thing, four out of seven RBOCs have disappeared since the Telecommunications Act of 1996 passed in February of that year.

Ameritech, Nynex, Pacific Bell and US West have been bought by other companies, with SBC Communications being the major buyer, snapping up Ameritech and PacBell.

Bell Atlantic was similarly active, swallowing Nynex and local/long-distance carrier GTE and renaming itself Verizon. Qwest Communications bought US West, leaving only BellSouth free-standing.

The consolidation of these regional companies has resulted in carriers with the assets and resources to become serious competitors to the likes of AT&T, WorldCom and Sprint.

While this growth has advantages, it hasn't been without pain to customers.

"Verizon is easier to deal with in that they are allowed by regulators to offer more options," says Bill Homa, chief information officer at Hannaford Brothers, of Scarborough, Maine, which operates 150 grocery stores on the East Coast. "But dealing with them still isn't my favorite experience."

As the RBOCs struggle to continually grow, they are following the course they set from the outset of telecom reform: Diversify beyond the local loop so they can offer customers packages of services.

The big carrot that the telecom act seemed to offer was the chance to sell long-distance service, but with the price per minute dropping, that is becoming less of a revenue draw.

After an initial flurry in the first year of the act to win the right to sell long-distance within their home territories, RBOCs have slacked off. So far, RBOCs sell long-distance in only two of their home states: SBC in Texas and Verizon in New York.

While not a high-margin business, long-distance bundled with other services is an easy sell. SBC and Verizon claimed 1 million customers within months of getting long-distance approval.

RBOCs have been more aggressive in other areas. For example, SBC aligned with BellSouth to create the joint venture Cingular, the second largest wireless network in the country. Verizon has bought Vodafone to create the No. 1 wireless network. AT&T wireless ranks third.

Beyond wireless, the RBOCs have made a push toward broadband access to consumers in the hopes of expanding the services they buy. They have devoted

Taking stock of the RBOCs
Since 1996, the regional Bell operating companies have done nothing but expand.

billions of dollars, extending the fiber in their networks. They have also become the dominant players in DSL access. SBC, Verizon and Qwest are the top three in DSL sales, according to Current Analysis. Some thought upstart providers would dominate this area, but the RBOCs have both stymied their efforts and chosen to team with them.

SBC's network upgrade program, called Project Pronto, relies on DSL to access customers, and plans

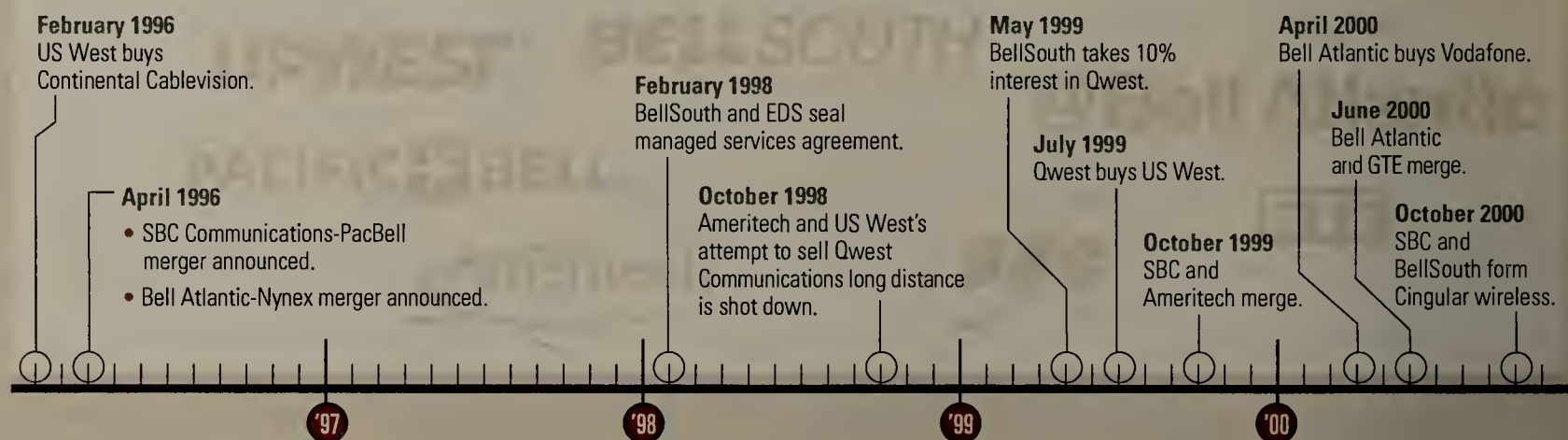
carriers, the resulting entities are much more formidable. Today, Verizon is headed for a \$63 billion earnings year. That is roughly what AT&T expects to bring in. SBC is on track to break \$50 billion, and BellSouth is headed for about \$26 billion. Qwest is shooting for \$18.8 billion (last year before the acquisition, Qwest made just \$3.9 billion).

While these changes speak well for the RBOCs as expanding businesses, customers find faults with existing services as the companies grow. Account teams to large companies are no longer as stable as they once were and require customers to be more diligent, says Rich Glasberg, manager of data services for the Commonwealth of Massachusetts, which uses Verizon for its local services.

"They have a lot of new people who are not savvy to the particular procedures of different customers," Glasberg says. "It's a lot of effort by my folks to make sure

RBOC business deals since the Telecommunications Act of 1996

Mergers, acquisitions, alliances and battles for the right to sell long distance mark the passage of time for local phone giants.



call for voice and data to travel over those links. The company has made a deal with DSL provider Covad Communications to help install DSL for SBC.

Similarly, Verizon bought NorthPoint Communications, another DSL provider, to help its DSL effort. Qwest uses Covad and Rhythms NetConnections to roll out DSL. This supplements the DSL push US West developed before it was bought.

The DSL situation has some observers claiming the RBOCs are running roughshod over the intent of the telecom act, which was to increase competition. "The telecom act has been a total, unmitigated failure," says Robert Rosenberg, president of Insight Research.

He says the RBOCs wrangle with competitors over access to RBOC networks in an effort to slow them down and then absorb them, effectively eliminating competition. Plus the competitors that predated the telecom act and were skimming top business customers — such as Teleport Communications, Metropolitan Fiber Systems and Brooks Fiber — have been bought by long-haul carriers.

As RBOCs buy each other or are bought by other

they follow the right escalation procedures when something goes wrong. There's not much predictability that the people on their end know how we operate and what our expectations are."

Growing pains are showing at SBC, too, where the Federal Communications Commission says it is concerned about "increasing installation delays, longer repair times and greater difficulties contacting SBC ... about service quality and other issues."

The FCC's letter focuses on the former Ameritech region and notes that "consumer complaints regarding service quality have increased in recent months in spite of SBC's explicit commitment when the merger was pending to devote greater resources to service quality after the merger closed."

While they may be faltering some along the way, the RBOCs are still most businesses' local exchange carrier and are trying to improve their performance. But it might take awhile.

"They'll take some time to get their acts together in developing [all-inclusive] packages for business customers," says Lisa Pierce, an analyst with Meta Group. ■



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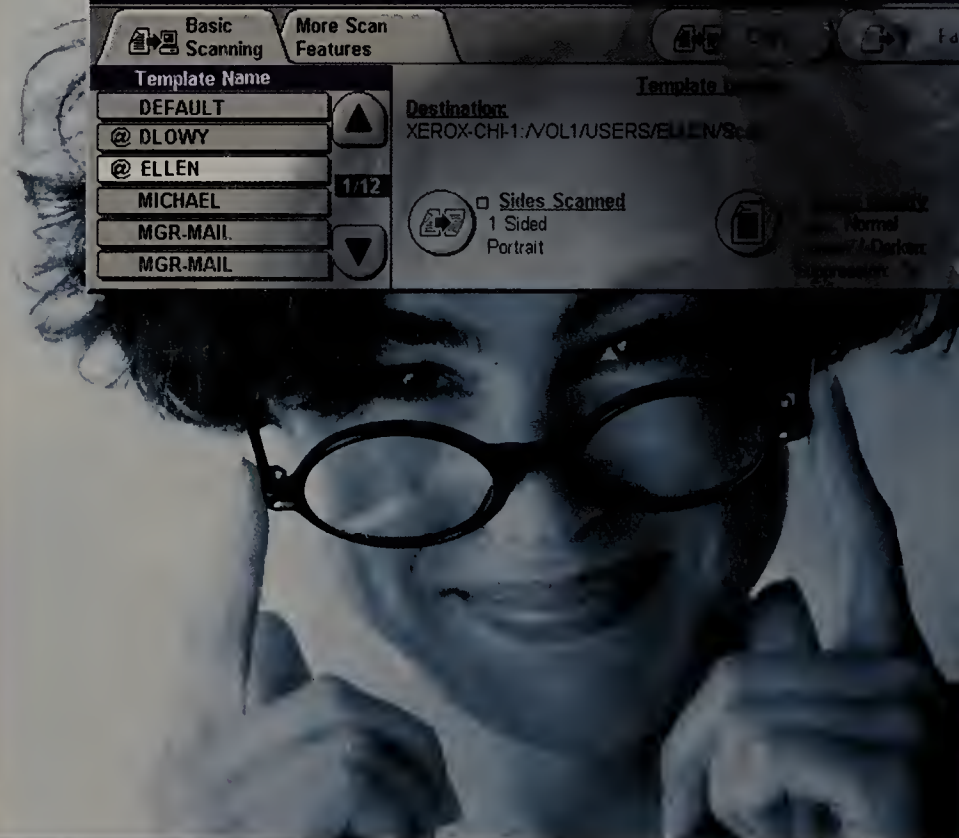
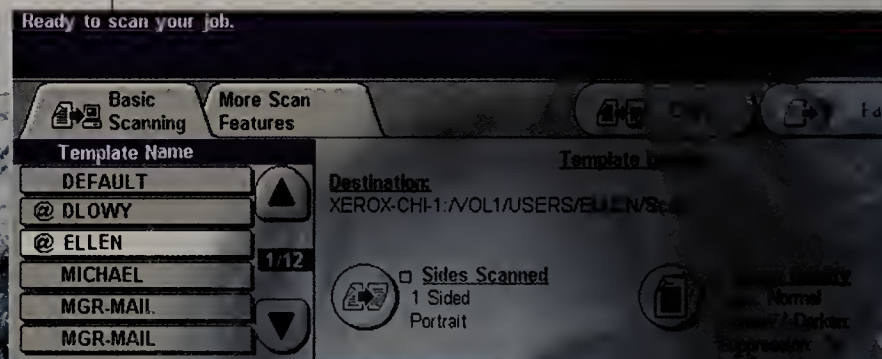
In fact, giving you new ways to leverage your IT investment by bridging the frustrating gap between the paper world and the electronic world is exactly what the Xerox Document Centre system was designed to do.

It's about document imaging for every workgroup.

If scanning is on your radar at all, you probably see it as limited to environments with dedicated operators. And so it has been. But the Document Centre system is changing that in big ways.

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The Edge

Service provider developments at
the juncture between the enterprise
and the new public network

Briefs

XO Communications, the successor to Nextlink and Concentric Networks following their merger, has selected **Sonus Networks** as a nonexclusive provider of softswitches and other packet telephony gear. XO says it plans to deploy the Sonus equipment, including the GSX9000 Open Services Switch, the PSX6000 SoftSwitch and the SGX2000 SS7 Signaling Gateway, in its network. XO will first use the Sonus gear to off-load ISP traffic from circuit switches, and eventually provide unified messaging, single-number service, credit card calling and conferencing.

XO: www.xo.com; Sonus: www.sonusnet.com

IP Communications, a Texas broadband carrier, has awarded Lucent a \$200 million contract to expand its network from California to the Great Lakes. Under the contract, Lucent will supply Stinger DSL access multiplexers, PacketStar broadband access concentrators, and CBX 500 Multiservice ATM switches. Lucent will also provide installation, maintenance and monitoring services for IP Communications' DSL network.

IP Communications: www.ip.net

Start-up **Filanet** has entered the integrated access device market with a premise device it calls an "Internet service appliance." The InterJak 100 includes dual USB ports to connect printers, hard drives and USB modem support for V.90, ISDN or DSL Internet access. It also has dual 10/100M bit/sec Ethernet ports and built-in IP routing, IP Security and firewall features. The base model, shipping next month, costs \$595, and Filanet is hoping to deploy it in businesses via service provider managed services.

Filanet: www.filanet.com

Qwest opts for ASC multiservice gear

Purchase boosts integration of traffic types, supports possible NxT-1 offers.

BY DAVID ROHDE

DENVER — Multiservice access aggregation vendor Advanced Switching Communications last week landed Qwest Communications as a new customer, and the contract for ASC's gear gives clues about potential Qwest offerings.

Qwest will deploy ASC's A-4000 high-density access concentrator, a chassis-based platform offering up to 392 ports worth of T-1 line equivalents. The A-4000 supports time-division multiplexing (TDM), ATM and frame relay traffic, and ASC's MultiStream software enables port-by-port configuration on the A-4000 to interwork the various protocols.

Qwest will place the ASC boxes principally in its own long-distance switching points of presence (POP) as an edge device. It will take in voice and data traffic and cross-connect DS-0, T-1 and T-3 links onto Qwest's backbone, says Mike Perusse, Qwest's senior vice president of engineering and technology.

This means Qwest does not have to

retain separate backbone networks to carry dissimilar traffic types, Perusse notes. For example, it can perform TDM-to-ATM and frame relay-to-ATM interworking. "That way, I don't have to haul frame around the network," he says.

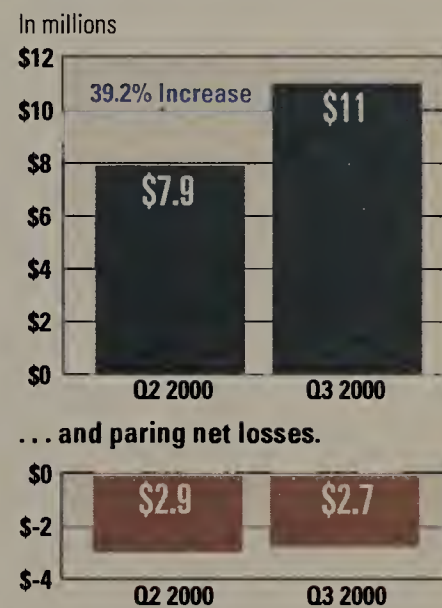
Qwest may also eventually use ASC boxes in collocation sites or other facilities outside its POPs. ASC has sold other carriers, including Intermedia and BroadBand Office, on the fact that the individual cards for the A-4000's 18 slots contain their own intelligence, and the same cards can be used in horizontal stand-alone or stackable pizza-box devices such as ASC's A-1240.

The smaller devices have appeared largely in collocation spaces and common wiring closets of multitenant office buildings. ASC says its product family gives service providers the flexibility to define the network edge wherever it suits them, letting ASC serve in-building, metropolitan and long-haul carriers.

In signing with ASC, Qwest also seized
See **Qwest**, page 42

Off and running

Advanced Switching Communications, which went public last month, is gaining revenue...



SOURCE: ASC, VIENNA, VA

3Com adds VPN flavor to its Total Control

BY PHIL HOCHMUTH

3Com has introduced software and hardware for its Total Control 1000 multiservice access platform that will let service providers offer VPN services over leased lines and DSL connections. The company also announced software integration with its Total Control 500 DSL Access Multiplexer product that will let providers sell DSL-based VPN services.

The addition of VPN capabilities to 3Com's Total Control products could help smaller service providers compete for business customers seeking VPN services.

3Com's new VPN enhancements are based on a combination of software, access router cards and digital signaling multispan cards. The combination of router and multispan cards can be configured

to act as a VPN concentrator, tunnel switch and termination point.

The Total Control 1000 can provide 1.5G bit/sec of Triple-DES hardware encryption and minimum support for 30,000 simultaneous tunnels for VPN customers per routing card. It also includes T-3 WAN connections.

The new software establishes virtual routers within the platform, letting service providers segregate memory and route tables for individual customers. That means users don't have to change their IP addresses to use a service provider-based VPN. This platform for VPN service provisioning is also media-independent and can be delivered with T-1, cable modem, DSL or wireless Code Division Multiple Access links.

3Com is also adding tun-

nel switching in the Total Control 1000, which lets a site using point-to-point tunneling protocol connect to a site using Layer 2 tunneling protocol. Both sites would connect through a Total Control 1000, which would translate between the two protocols.

3Com's integration of the enhanced Total Control 1000 with its 192-port Total Control 500 DSL concentrator will also let service providers combine VPN functionality with DSL services for individual and business customers.

3Com's combination of VPN technology in a single chassis will eliminate the need for service providers to buy separate products for delivering VPN services, according to analyst Steve Byars in a report for Current Analysis. That should help service providers better deliver high-end remote access networks and business extranets, Byars says.

But Byars adds that 3Com will have a challenge competing with more estab-

See **3Com**, page 42

VPN services to boom

By 2004, the
worldwide market
for VPN products
and services will
reach \$40 billion,
with services
accounting for 90%
of revenue.

SOURCE:
INFONETICS RESEARCH



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WWW.DYNARC.COM

Novell boosts Internet mail package for ISPs

BY DENI CONNOR

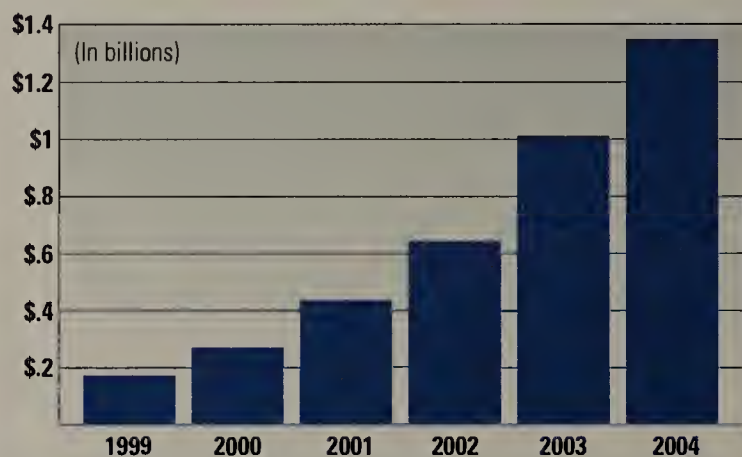
SAN JOSE — Novell has bolstered its standards-based Internet messaging system for ISPs and application service providers by adding features that increase the security and performance of the system and make wireless Web access possible.

The Novell Internet Messaging System (NIMS) 2.6, introduced at ISPcon in San Jose last week, now supports Wireless Markup Language (WML) and global system for mobile communications (GSM) standards and lets users with virtually any wireless phone access their e-mail from remote locations. WML, formerly the Handheld Devices Markup Language, lets content be displayed on narrowband devices such as wireless phones. GSM allows for interoperability across international boundaries.

"We have a large user base with handheld devices, Palm Pilots, pagers and phones," says

Wireless data abound

Cahners In-Stat predicts that worldwide wireless subscribers will increase to more than \$1.3 billion by 2004.



Chris Kirkwood, principle for KIS Communications, an Internet and application hosting company in Irvine, Calif. Kirkwood has about 3,000 users that access NIMS on a NetWare server. He plans to install NIMS on Linux and Solaris servers.

"With NIMS you can create,

reply and archive mail — anything you can do with a normal mail client," he says.

Web-Foot Research expects that wireless phone services will boom from \$172 billion in 1999 to more than \$480 billion by 2005.

NIMS also now use Open-

SSL, which allows connections to take place with little performance penalty. According to company claims, OpenSSL is capable of 80 handshakes per second, or double the previous version of Secure Sockets Layer (SSL). OpenSSL is SSL combined with the Transport Layer Security (TLS) protocol that provides communication privacy over the Internet. TLS provides security at the Open Systems Interconnection Transport Layer.

"OpenSSL encrypts the communication when you are online, so it is private," Kirkwood says. "OpenSSL is compliant with everything out there."

In addition, NIMS also supports a list server. "The list server works just like a major-domo would," Kirkwood says. "If you want to broadcast a message to all your customers, you can. For instance, you could build a mailing list of every subscriber and send them a message, such as a

price list or notification of a company meeting."

Administrators can also make configuration changes, add new users or groups of users to the messaging system without taking down the message server, saving time and money. The system also executes a self-cleaning task, and performance has increased by 20 to 30% over the last version, company officials say.

NIMS is \$20 per user and is available now. ■

www.nwfusion.com

NIMS IN ACTION

See how top firms are using Novell's Internet Messaging System.

DocFinder
find it 1824 online

Telseon to deploy Foundry switches

BY MICHAEL MARTIN

DENVER — Metropolitan Ethernet provider Telseon revealed earlier this month that it will deploy BigIron Layer 3 Gigabit IP switches from Foundry Networks in its optical network buildout.

Telseon also uses switches from Extreme, Riverstone and "a couple of start-ups," according to Mick Seaman, Telseon's chief technology officer.

Through its optical metropolitan networks, Telseon gives customers 1M to 1,000M bit/sec bandwidth over native Ethernet. Once Telseon customers establish a connection to Telseon's network and have an edge switch at their site, they can order bandwidth on demand through a Web interface.

Although many switch vendors boast about their Layer 3 to Layer 7 services, Seaman says the only layers that matter to Telseon are Layers 2 and 3. Traffic shaping and quality-of-service (QoS) features let Telseon ensure there is adequate band-

width to support a customer's bandwidth request and establish redundancy. This lets Telseon offer solid service-level agreements, Seaman says.

The BigIron models Telseon will initially use are the four-slot 400 and the eight-slot 800, says Bob Gibson, Foundry's director

Pumping iron

Features on the Foundry BigIron switches being deployed by Telseon include:

- Up to 120 Gigabit Ethernet ports.
- Up to 480G bit/sec of total switching capacity.
- BGP4 and PPP protocol over SONET.

of marketing. Telseon also is considering the BigIron 15000.

The BigIrons will be deployed in the core of Telseon's metropolitan nets, he says. Telseon also uses Extreme switches in its core network and Riverstone switches as edge devices.

"If you're looking for a com-

monality in our switch suppliers, they can all take the switches they developed in their enterprise beginnings and exert controls over them to make them suitable for a public network," he says.

One reason Telseon uses multiple vendors is to take advantage of each vendor's product development cycle. "Each vendor has its own cycle, and we want to make sure we're taking advantage of the latest equipment," he says.

Foundry's Gibson says such a strategy is the norm for metropolitan network providers. "I don't think any of the players in that market are going to go with one vendor," he says.

In addition to the Telseon deal, Foundry is selling switches to broadband provider Telocity. Gibson expects to announce deals with other metropolitan carriers soon.

The BigIron 15000 is shipping now. The chassis costs \$17,500.

Foundry: www.foundrynetworks.com.

Qwest,
continued from page 39

on the fact that the MultiStream software for the ASC product line supports two key standards for NxT-1 services: inverse multiplexing over ATM (IMA) and multilink frame relay. Along with its bigger, long-distance rivals, Qwest has ceded the field for standards-based inverse muxing between T-1 and T-3 to players such as Intermedia and PSINet.

But now "there's interest in the product side of Qwest" in these offerings, Perusse says. "We've been playing with IMA in the lab. It depends where sales and marketing take this."

One area where Qwest has not offered a service comparable to AT&T and WorldCom is in a type of hybrid WAN that employs Multi-protocol Label Switching (MPLS) on IP packets to create any-to-any connectivity over a conventional star-topology frame relay network.

ASC marketing Vice President Larry Kraft says MPLS support for this cross of IP VPNs and frame relay is on ASC's roadmap for 2001.

Under the two-year contract, Qwest will buy a minimum of

\$24 million worth of ASC gear in the first year, according to Kraft. A fully loaded A-4000 generally lists for \$250,000 to \$350,000, although bulk discounts bring that range down to \$150,000 to \$250,000.

For the amount of scale ASC provides, "they're the only game in town," Qwest's Perusse says.

He adds that ASC has delivered its product "on time and on budget, which is shocking in this industry."

ASC: www.asc.com

3Com,
continued from page 39

lished service switch/DSL concentrator product combos that provide comparable functions. Those include Nortel Networks, with its IMAS and Shasta 5000, and Lucent's Stinger/SpringTide combo. 3Com's lack of presence in the high-end point of presence and central office equipment markets could hurt its ability to sell outside of its own carrier installed base.

Senior Editor Tim Greene contributed to this story.



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will be running fast
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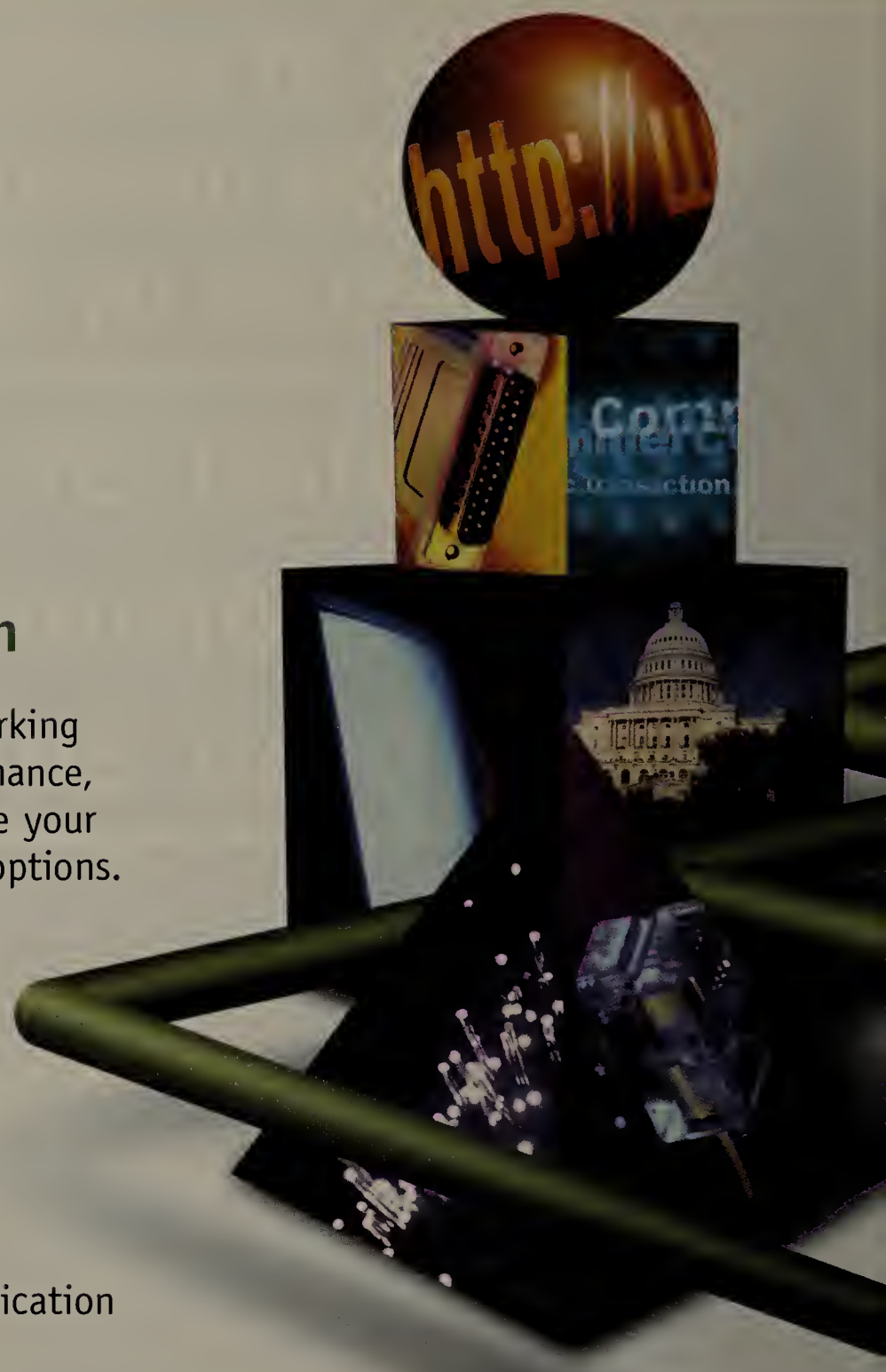
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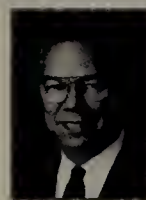


Don't Miss These Exciting Keynotes (Open to all attendees)

Tuesday, January 30th

Wednesday, January 31st

Thursday, February 1st



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Briefs

Electronic Data Systems (EDS) last week said it will open a mostly Web-based cyber-security school that will offer training and certification in computer forensics, intrusion detection, public-key infrastructure and other areas. The virtual school, called the Cyber Security Institute, will open in January. EDS is producing most of the course material, including the 95% that will be offered over the Web.

The EDS Cyber Security Institute will offer seven tracks, including net vulnerability assessment, and business continuity planning and procedures. EDS is partnering with RSA Security, F-Secure and others to develop the curriculum in public-key infrastructure, firewalls and intrusion detection.

EDS: www.eds.com; Cyber Security Institute: www.cybersecurityinstitute.com

Axent Technologies this month ships VelociRaptor, a Linux-based firewall appliance and VPN co-developed and marketed with Cobalt Networks. The device is aimed at ISPs that want to offer firewall services to small and mid-size businesses. VelociRaptor, based on Axent's Raptor 6.5 firewall, costs from \$4,995 to \$14,995.

Axent: www.axent.com

Transparent Language has announced Enterprise Translation Server 4.0, which now provides automated real-time cross-language translation in Chinese, Japanese, Korean and Russian in addition to its earlier support of English, Spanish, French, German and Norwegian. Version 4.0, which costs \$25,000, works with Microsoft Windows 2000, including Word, PowerPoint, Excel and FrontPage, in addition to its earlier integration with Microsoft Exchange/Outlook, Lotus Notes and Lotus Domino applications.

Transparent Language: www.transparentlanguage.com

EmailXtras offers desktop archiving tool

ShadowMail package lets users archive, index and search e-mail.

BY JOHN FONTANA

As e-mail usage continues to skyrocket, the issue of managing and storing bulging mailboxes is starting to become a significant issue for many e-mail administrators.

To protect the performance of its servers, many companies have imposed limits on mailbox size. The move almost always draws howls from end users who crave space to store e-mail.

One possible solution to the issue was introduced last week by emailXtras. The Dedham, Mass., company released ShadowMail, which creates an e-mail archive on users' desktops that can be indexed and searched.

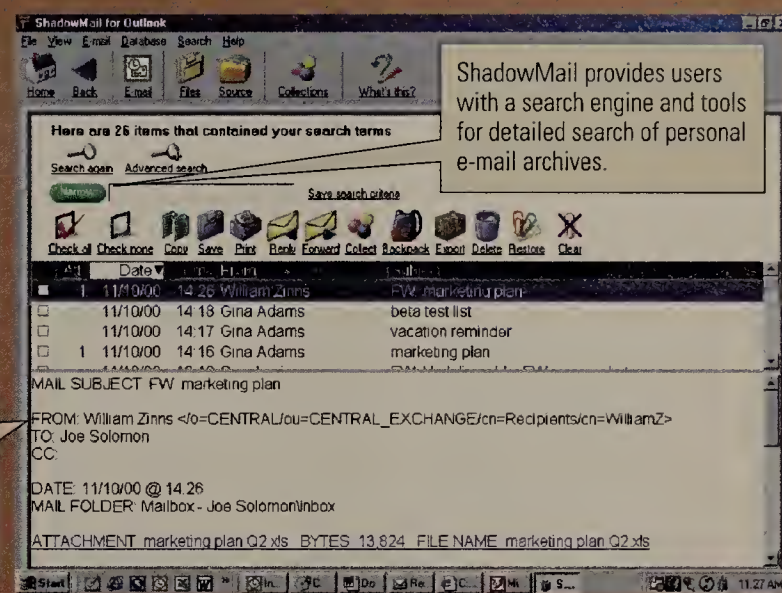
The software downloads users' server-based message store into the personal desktop archives. ShadowMail, however, also has tools that let e-mail administrators set security on the archives, update software automatically and control where users store messages. For example, administrators can dictate that user's can't store e-mail on removable drives.

The software works with Microsoft's

Archiving made easy

ShadowMail from emailXtras creates a personal archive where e-mail can be searched and indexed.

The interface lets users read e-mail from within the search results window.



Outlook/Exchange and Novell's GroupWise packages.

Client software for both systems offers archiving tools, but the capabilities are limited. For example, in Outlook the Personal Folder Filer, called a PST file, is notoriously unstable.

"The PST is not searchable and can't be indexed, and those files have their known corruption issues," says Hoby Cook, information services manager for Thomas H. Lee Company, a financial services firm in Boston.

See **Archive**, page 48

Comergent bolsters supply-chain software

BY ELLEN MESSMER

REDWOOD CITY, CALIF. — Comergent Technologies shipped a new version of its Java-based, supply-chain management software that makes it easier for buyers to make complex equipment and software purchases online.

The Comergent e-Business System 4.0 now includes a configuration tool that lets sellers guide their trading partners to particular types of equipment based on specific technical details the buyer inputs via a browser. The Comergent software used for business-to-business selling has also added analytical tools for sales forecasting, partner inventory reporting and geographic sales performance.

Installed at 30 corporations, including Cisco, Seagate and their distributors Ingram-Micro and TechData, the Comergent e-Business System provides a way to quickly share inventory information across the Web when a business buyer,

such as Circuit City, wants to place an order online using a browser.

The manufacturer and distributor have to install the Comergent e-Business System behind their public Web servers to share supply-chain information.

For example, distributor TechData makes use of Comergent with Seagate, a

computer-equipment manufacturer that TechData purchases from in bulk, according to David Lafferty, TechData's vice president of e-commerce.

A TechData customer such as Best Buy or Circuit City typically reads about Seagate products at Seagate's Web site. But Seagate doesn't sell directly, so when the business buyer wants to make a purchase, Seagate's Web site lets this buyer compare distributors — such as TechData — for availability and pricing.

The Comergent server, sitting behind the Seagate Web server, can display inventory information pulled from distributors that have also installed a Comergent Java server internally to pull data from back-end systems.

"That buyer, basically a re-seller, has to have an account with TechData to begin with, but we can tell the buyer we have 2,000 Seagate hard drives in stock, for example, through Comergent, which is

See **Comergent**, page 48

Web-based software made easy

Comergent Distributed e-Business System 4.0 is used by manufacturers to share supply-chain information. New features include:

- Interactive sales and marketing so trading partners can configure products online.
- Analysis tools that provide metrics on customer behavior and geographic sales performance.
- Availability as a hosted application from partner.com.
- Pricing starts at \$100,000.



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Microsoft invests \$50 million in USinternetworking

BY JENNIFER MEARS

Microsoft last week took another big step into the application service provider (ASP) market, announcing a \$50 million equity investment in USinternetworking as part of a strategic alliance to develop, market and deliver managed application services built on the Windows 2000 and .Net platforms.

The Microsoft alliance was one of several developments detailed by USinternetworking, including a strategic alliance with wireless ASPs Aether Sys-

tems and a round of more than \$300 million in equity and commercial credit funding.

With the Microsoft alliance, USinternetworking gains muscle in marketing managed application services. The two companies will jointly develop, market and deliver services that will be powered by the Windows .Net platform. .Net is Microsoft's overarching plan to transform Windows into a platform for the Internet. It will include a new operating system, server applications and development tools, with a heavy dose of XML.

Microsoft has been working

diligently to bring ASPs into the .Net fold by offering incentives to host its products and laying out licensing schemes for hosting Office and Windows server platforms. Corio, Equant and others have similar relationships with Microsoft.

USinternetworking already offers Microsoft Exchange-based messaging and collaboration service through its iMAP portfolio of services. But the alliance builds on that relationship by bringing Microsoft's engineering and technical support to all USinternetworking's products.

The company has agreed to use Microsoft's technology platform for all its iMAP offerings. In addition to providing Microsoft products, USinternetworking will continue to offer corporate resource applications such as Siebel, PeopleSoft, Lawson and Ariba.

Microsoft will provide USinternetworking with engineering and technical support to launch new offerings and to move existing services to the Microsoft platform.

USinternetworking says the first of the Microsoft technology-based services will be avail-

able next month, with additional services to be released through May 2001.

In the wireless arena, USinternetworking has partnered with Aether to create enterprise-level managed application services for wireless

devices. The first joint offering — wireless e-mail and messaging services for Microsoft Exchange via Blackberry — is available immediately. USinternetworking says wireless-enabled Web and e-commerce applications will be released in the next two months, with more wireless applications coming next year. In addition to its technology investment, Aether committed \$10 million to USinternetworking. ■

Focused on funds

In addition to investments from Aether and Microsoft, USinternetworking last week announced the following:

- A \$60 million equity investment by USinternetworking's early investors — including USinternetworking's Chairman Christopher McCleary and CEO Andrew Stern — that also includes a \$5 million equity commitment from a wholly owned subsidiary of GE Capital.
- A \$50 million commitment on a three-year revolving line of credit led by GE Capital.
- The closing of an equity financing arrangement covering the sale of \$140 million in USinternetworking common stock with Acqua Wellington North American Equities Fund. The arrangement gives USinternetworking access to as much as \$140 million over the next 28 months.

Archive,
continued from page 45

Cook says with ShadowMail he can "off-load some of the mail from our servers, and we don't have the burden of huge message stores that can affect performance."

Cook is evaluating ShadowMail for his mobile users so they can create their own archive as opposed to setting up a network archive.

Archiving is becoming a real issue for businesses. Research firm Creative Networks says nearly one-third of critical business information is stored in e-mail. But the firm has found that only one in four organizations has deployed an archiving system that lets end users retrieve mail without IT intervention. On top of that, the research shows that it takes, on average, 45 minutes to find a message that is two months old.

ShadowMail can cut search time dramatically, say company

officials, because users store e-mail in encrypted databases on their hard drives, Zip drives or CD-ROM. Users also can store data on the Internet with Xdrive.com, a free online storage site.

ShadowMail includes an extractor that adds a "Save to archive" button to Outlook and GroupWise. It also includes database tools for rebuilding, compacting or moving data stores. The viewing software, which is launched from within the e-mail client, is a Web-based interface, which means users can view mail created with any e-mail software.

"A primary need in archiving is user accessibility, but I think this type of desktop archiving fills only a niche," says Michael Osterman, an analyst with Creative Networks.

"It's critical to have some kind of centralized control for the enterprise," he says.

ShadowMail is moving in that direction and will "evolve to

include the ability to store mail on an archive server," says Greg Arnette, president and founder of emailXtras.

ShadowMail is priced from \$10 to \$99 per user based on volume discounts. The software is available now and runs on any platform Outlook or GroupWise supports except Macintosh.

EmailXtras: www.emailxtras.com

www.nwfusion.com

ROAD TEST

See if ShadowMail is right for you. Download a 30-day trial of the product.

DocFinder
find it 1826 online

Netscape finally launches latest browser

BY GOPIKA VAIDYA

It was a long wait. After a three-year succession of minor upgrades, Netscape last week released the 6.0 version of its Web browser.

Netscape 6.0 features a slick, customizable user interface, its own version of AOL's instant messaging service and a program called Gecko that quickly makes Web page text and graphics. In the U.S., Netscape 6 is available on Windows, Linux and Macintosh, while in other countries, it will initially be available only for Windows. Support for other platforms is expected to be introduced within two months.

New features in the latest version include a My Sidebar option, located on the left panel of the browser, which lets users store information, look up the latest news headlines and stock quotes, listen to music, and access more than 600 different customizable tabs from Netscape and other companies, such as CNN.

Web browsing, e-mail and instant messaging are combined within one frame in Netscape 6, unlike previous versions in which these services

were provided by separate applications. Privacy control features such as the Password Manager, Cookie Manager and Forms Manager address users' concerns about security.

The Cookie Manager lets users decide which sites they want to accept cookies from. Microsoft's Internet Explorer has a similar feature, says Sol Goldfarb, Netscape's director of product marketing.

Netscape 6 is also locked by a Password Manager. Users can lock the browser with a master password and store passwords for various Web sites within the browser. "With other browsers, you can say 'Remember my password,' but anyone who steps up to your computer has access. With Netscape 6's Password Manager, they can't access the Web sites unless they have a master password," Goldfarb says.

The browser also has a Forms Manager that lets users decide how much information they want to reveal about themselves when filling out forms on the Internet.

Vaidya is a correspondent with the IDG News Service's Boston bureau.

Comergent,
continued from page 45

integrated into our supply-chain software on an IBM mainframe," Lafferty says.

If the buyer wants to purchase from TechData, Seagate's Comergent server can transfer the buyer's Web-based shopping cart to the TechData Comergent server, which sits behind the corporate Web server and firewall.

With the new Comergent

configuration tool, buyers can go to the manufacturer or distributor Web sites to input specific information about buying requirements and be guided toward products that meet those needs.

TechData has a total of \$17 billion in annual sales, with about \$5 billion of that originating as e-commerce orders placed through Electronic Data Interchange or the Web.

Comergent: www.comergent.com

Fe NETIRON



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All of which means the NetIron400, NetIron800 and NetIron1500 are essential in creating the world's fastest, most reliable backbone networks.

Call 1.888.TURBOLAN (887-2652), email info@foundrynet.com or go to www.foundrynetworks.com/nw1 to formulate your own opinion.



**FOUNDRY
NETWORKS**

'Net Insider . Scott Bradner

NEXT TIME VIA THE 'NET?

For some reason, voting technologies have been on my mind. The voting systems currently used in the U.S. clearly have some shortcomings.

Many of these shortcomings can be overlooked when the voting population expresses a clear preference for a particular candidate, but their impact

is magnified when an election is close. Clearly there will be a lot of attention toward election processes and technologies in the next few years. But how seriously should Internet-based voting be considered?

A few people did vote in the 2000 presidential election electronically

over a network. Having a few hundred military personnel vote over a closed network may have been an interesting experiment, but there are more than a few problems with developing systems to permit even a small percentage of the American electorate to indicate its preferences over the Internet.

There are obvious issues of scale, reliability and security. Any Internet-based voting system would have to handle millions of simultaneous users. It would have to be designed to prevent Moscow teenagers from deciding the election. The infrastructure would have to be an order of magnitude more reliable than much of the Internet. In addition, the system would have to ensure voter anonymity while at the same time guarantee that people could not vote more than once.

These problems have direct analogues in the current voting system, but there are some other issues that are exacerbated or created with a move to electronic voting. Things as simple as voting hours and the reporting schedule become major issues. What should be considered "Election Day" on an Internet that spans 24 time zones? If it is to be one day (which could get rather hectic), is it 7 a.m. to 8 p.m. in the time zone where the voter is registered? Or should it be some simultaneous window for the whole country (and for overseas voters)? When should the public be able to find out how the voting is going?

Should the current system of staggered reports continue or should we have a "big bang" of simultaneously announced results?

A major problem for some people would be the lack of exit polls — there would be no way to figure out what special interest to target next time. That would break my heart.

Equal access for people from all walks of life would be hard to guarantee. It is probably easier to design confusing electronic ballots than it is to design confusing paper ones, if looking at the Web sites reporting election results is any indicator.

There are some initial attempts at electronic voting, such as the recent Internet Corporation for Assigned Names and Numbers elections run by election.com. But these are halting first steps at best. So there are no panaceas here — we can look forward to this kind of fun for years to come.

Disclaimer: Since Harvard has a law school, the university does not believe in panaceas — they reduce litigation. But the above observation is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

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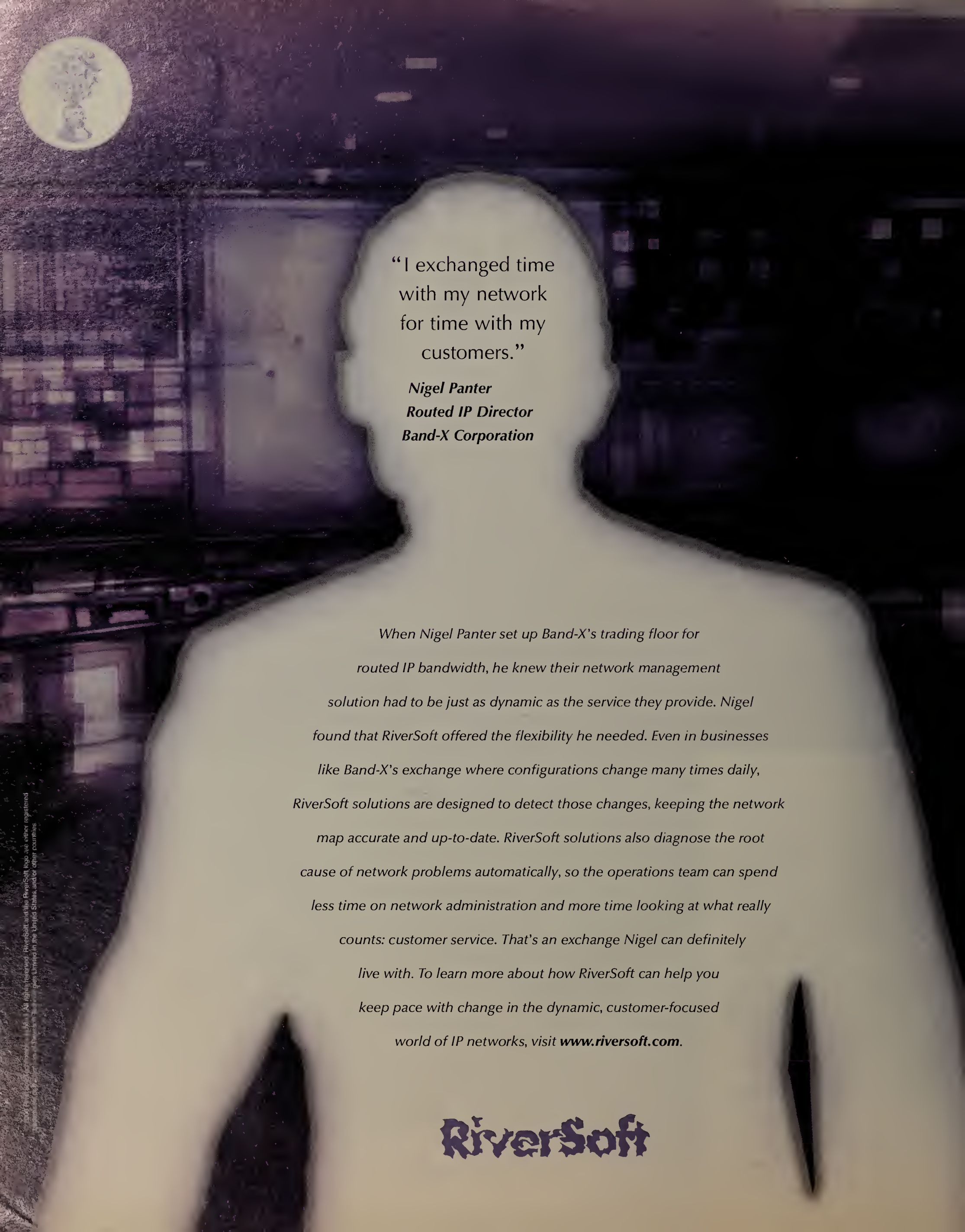
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with my network
for time with my
customers."

*Nigel Panter
Routed IP Director
Band-X Corporation*

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Ask Dr. Intranet

By Steve
Blass

I'm the sole provider of network, database administration, hardware/software troubleshooting and all-around computer

help for a social work department at a university. I was given the project of building an intranet for our faculty. I have an idea of how it operates and why we need one, but I have no clue where to begin. We have a Windows NT Server 4.0 with Windows 9X workstations, and approximately 20 faculty members who will use the intranet.

Start with your business goals. Survey the prospective user base. Find out what people would expect to find and do if the department has an outstanding intranet. Seed the interviews with questions about what kind of course and committee scheduling needs the team faces. Find out whether departmental publishing or interactive Web-based training and testing tools are envisioned. Will the department use online collaboration tools to support distance education? Will you create a portal to external online resources? Determine if the information and capabilities to meet your vision exist. Decide what application systems and data formats you have to work with. Identify the barriers to achieve these goals. Can you see technology solutions for individual barriers yet? Boil the departmental intranet problem down into solvable component problems, and solve those at the technology level.

Blass is a network architect at Sprint Enterprise Network Services in Houston. He can be reached at dr.intranet@paranet.com.

Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Firewall acceleration over ATM

BY MICHAEL LADAM

Firewalls are not new; but high-performance firewalls are. Historically, firewalls used software to examine every packet and then make the decision to forward or drop the packet. This made them slow.

When administrators placed them in line with low-speed WAN access links, firewalls introduced no bottlenecks. But the trust boundary where a firewall is needed doesn't always lie at a WAN link. A finance department's network

eliminate performance bottlenecks and to let administrators deploy firewalls wherever they are needed.

A flow is a series of packets with the same values in particular IP fields — for example, source IP address, destination IP address and TCP port numbers. Firewall accelerators examine these fields in hardware.

The first packet of a flow is diverted to a traditional software firewall where security policies are stored; the accelerator then learns to recognize and act on (forward, drop or monitor) subsequent

firewall accelerators supported only Ethernet because IP packets that split into 53-byte cells could not be examined at line rate.

Expedient solution

The National Security Agency has solved that problem with technology that tracks ATM packet framing to extract a copy of each packet's IP header, with no time-consuming reassembly of cells into packets. Through selected commercial partners, this technology is giving birth to a new generation of IP/ATM firewall

HOW IT WORKS

In-line firewall acceleration over ATM

Firewall accelerators consist of two main sections—a firewall in-line processor (FIP) and a firewall control processor (FCP).

5 Flow instructions are sent to the ATM tag/buffer in the firewall in-line processor and the IP buffer. These instructions will be applied to other cells having the same ATM tag and IP headers.

1 An ATM tag/buffer extracts an ATM tag and results. The tag and results are forwarded to the IP buffer.

2 The IP buffer inspects the ATM tag and IP header. If the IP header has been recognized, and authorization was received from the FIP authenticating the packet, it is passed through (red line). If the packet header is new, it is passed to the FCP (orange line).

3 Inside the FCP, the cell is inspected and a decision is made to approve or to deny the cell.

4 The approved cell is sent to a re-inject buffer in the FIP, and the packet is transmitted into the data stream.

Write explicit flow to ATM and IP:
• Allow • Deny
• Monitor by FCP

Inspect cells:
User-defined rules

Approved cells:
Re-insert

needs protection from disruption by other departments in the building.

Also, the speed of WAN links is increasing as the use of the Internet grows. Multigigabit links to metropolitan-area networks will become commonplace over the next few years. At these speeds, the performance bottleneck of older firewalls will be exposed.

But a new generation of firewall accelerators use flow recognition to

packets independently. This provides firewall security at line-rate speeds.

Firewall accelerators appeared two years ago offering 10/100M bit/sec and Gigabit Ethernet interfaces.

However, many network administrators with the most demanding security concerns select ATM as their network transport. They do so for a number of reasons:

- ATM's connection-oriented architecture makes it resistant to denial-of-service attacks.
- Assigning a bandwidth profile to a connection guarantees its performance.
- The fixed length of ATM cells makes high-speed bulk encryption practical and affordable.

Although ATM is often used in highly secure networks and commonly used at the WAN access trust boundary, early

accelerators.

With an IP/ATM firewall accelerator, cells of the first packet are forwarded to the firewall control processor (FCP), which consults its filtering policies to determine whether to forward, drop or monitor the packet.

Forwarded packets are re-injected into the cell stream, and the FCP informs the firewall inline processor of the action to take on subsequent traffic for this flow. One firewall accelerator using this technology offers a choice of OC-3c or OC-12c interfaces, performing line-rate firewalling at either speed.

Ladam is director of strategic marketing for Marconi Corp.'s Enterprise business. He can be reached at Michael.Ladam@Marconi.com.

Got great ideas?

Network World is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Mark Brownstein, Technology Editor (mbrownstein@nww.com).



Gearhead . inside the network machine . Mark Gibbs

AFTER THE SYN FLOOD

In last week's Gearhead about how ports work, our fingers got a little overzealous and we typed `www.isi.edu/in-notes/iana/assignments/portnumbers`

when we meant `ftp://www.isi.edu/in-notes/iana/assignments/portnumbers` (thanks to Bill Verzal, who was the first to spot our faux pas.

As we said last week, a computer responds with a SYN-ACK when it receives a SYN packet from another machine. The SYN request is the first part of the TCP three-way handshake we discussed, and the SYN-ACK response is the second. Most computers will generate the SYN-ACK response whether or

not a service is available on the port.

The third part of the three-way handshake is an ACK from the original machine that first sent the SYN request.

Now one of the big problems with this protocol sequence is that in many implementations of the TCP/IP stack, the receiving machine will accept the SYN request for an "open" port, create a data structure to handle the attempted request, and reply with a SYN-ACK. If the machine that sent the original SYN request doesn't follow up with an ACK response, then the receiving machine has to timeout on waiting for a reply.

Once the timeout occurs, the receiving machine safely disposes of the data structure that was set up to handle the possible connection. But if multiple SYN requests are received within the timeout period, the TCP/IP stack must simultaneously create multiple data structures.

If enough SYN requests are received, the receiving machine can't accept new SYN requests due to a lack of data storage (that will be a limitation of the TCP/IP stack or simply running out of local operating system resources). It may also be that the receiving machine becomes so busy servicing SYN requests that other TCP/IP activity is significantly decreased or stopped altogether.

This is the nature of your classic SYN flood attack, a technique favored by discerning hackers over the past few years. It is considered to be a denial-of-service attack and can effectively block even a large pipe to the Internet, not by exhausting the pipe's capacity but by exhausting the resources of the machines using the pipe.

A SYN flood attack is difficult to counter because the source of the attack may not be obvious. This is because software found on the 'Net can be run on a machine that creates SYN requests such that the source address is a fake and changes with each SYN request sent.

There are several approaches to defending against SYN flood attacks that involve filtering and patches to operating systems. A discussion of an interesting technique called GENESIS (Gibson's Encryption-Enhanced Spoofing Immunity System) can be found at <http://grc.com/r&d/nomoredos.htm>.

See the CERT Advisory (from 1996), "TCP SYN Flooding and IP Spoofing Attacks" (www.cert.org/advisories/CA-1996-21.html) and Microsoft article "Internet Server Unavailable Because of Malicious SYN Attacks" (<http://support.microsoft.com/support/kb/articles/Q142/6/41.asp>) for more information.

Finally, check out the Hack FAQ "Denial of Service Basics" (www.nmrc.org/faqs/hackfaq/hackfaq-5.html), which discusses SYN flooding as well as smurf attacks (www.nwfusion.com, DocFinder 1829) and Ping o' Death.

Next week, sockets and hacking. Message on the sly to gearhead@gibbs.com.



An exclamation point doesn't always make your point.

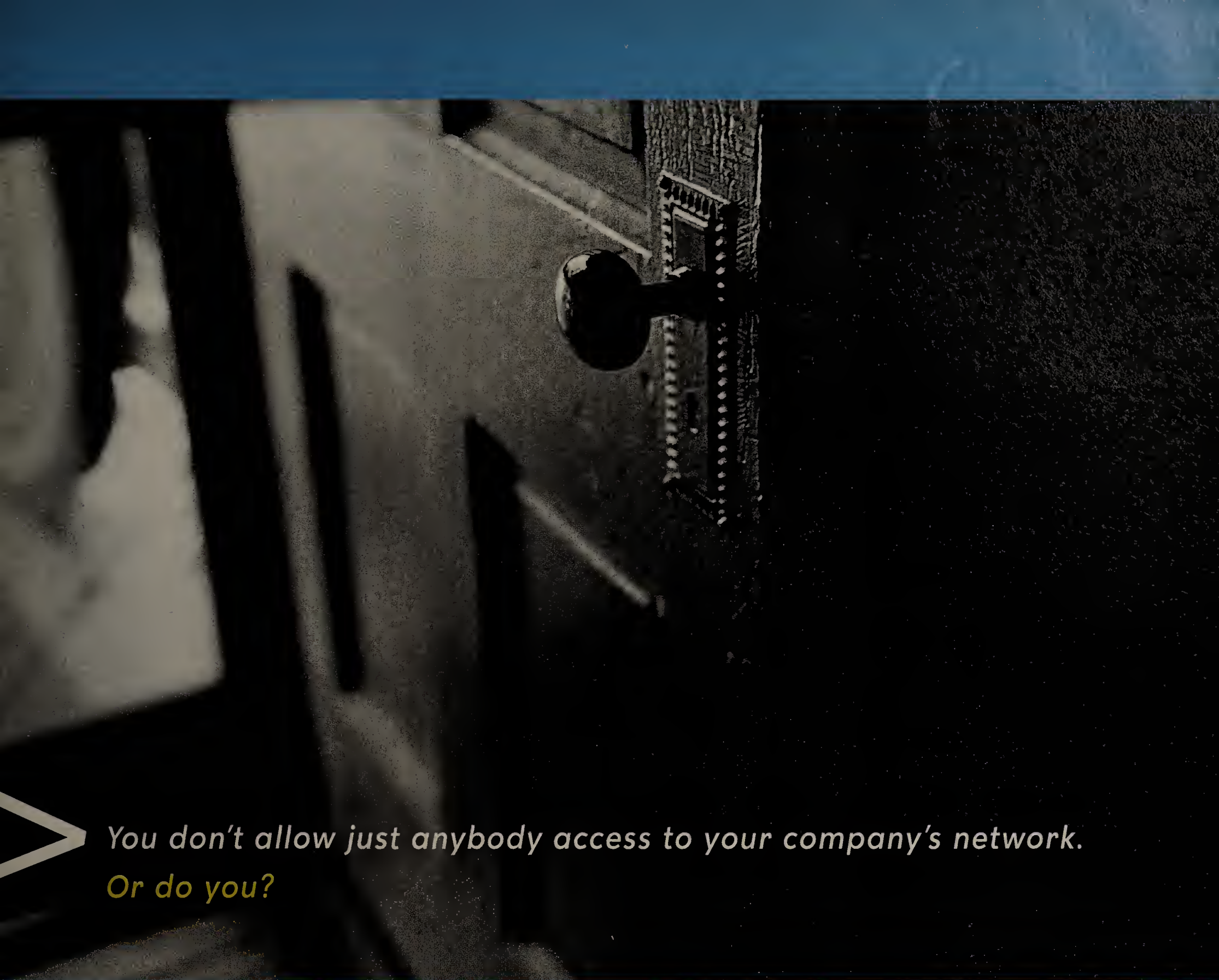


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Editorial

A challenge to the security software leaders

I'm back in the saddle. I haven't done a Showdown debate since May, when we had the leading purveyors of broadband networking facing off against one another on the NetWorld+Interop stage in Las Vegas. Now it's the security vendors' turn.

I'll be staging a presidential-style debate — dubbed "The Security Showdown" — among the top security software providers at the ComNet Conference and Exposition on Jan. 30 from 1:15 to 2:30 p.m. in Washington, D.C. (For more information go to www.comnetexpo.com.) During the debate, you'll hear the leading security software companies

outline their strategies for protecting your networks and e-business applications from the ravages of hackers, crackers, internal malcontents and other threatening types. They'll also have to answer tough questions from a panel of experts and face questioning from each other in this fast-paced session.

Security is a red-hot concern for network professionals — it seems we can't keep up with the rapidly growing and mutating threats to our networks. This session will help you get a better handle on the differences among key security players and determine which will be your best partners.

To make this Security Showdown a reality, I'm challenging Computer Associates, Network Associates, Symantec, IBM and Check Point Software Technology to send a top technology executive to take part in the debate.

According to IDC, these are the five market share leaders in the security software market. Together, they hold leadership positions in four key areas of security software: encryption; anti-virus software; software-based firewalls; and authentication, authorization and administration.

These vendors have until Dec. 5 to confirm their participation and give us the names of their speakers.

If anyone refuses to stand up and be counted, we'll choose another security company to take the laggard's place. But that hasn't been a real problem in our Showdowns — only a few companies have taken the back door when asked to participate.

Send me questions about what you'd like to ask these vendors. Mark your calendars, too.

And to CA, Network Associates, Symantec, IBM and Check Point: Are you up to the challenge?

— John Gallant
Editorial Director
jgallant@nw.com

Message Queue

VOIP VIEWS

The story "VoIP to carry 'bandwidth tax'" (www.nwfusion.com, DocFinder: 1739) misinforms readers by mentioning only the 40-byte IP overhead incurred by 20-byte or larger voice packets. This overhead can be reduced to between 2 and 6 bytes using header compression as defined in RFCs 2507, 2508 and 2509. Given these standards and many implementations of header compression, I fail to understand why the story mentions only one proprietary product.

The usual "voice over ATM is better" line is also quoted, out of context with the topic, invoking the quality-of-service (QoS) argument. What about QoS on IP/Ethernet, the relevant standards and the large number of Ethernet products with QoS reported in your publication?

Voice over IP is highly successful in the market, as reported elsewhere in the same issue ("Cisco lands large VoIP deal," www.nwfusion.com, DocFinder: 1740; "SBC prodding companies toward VoIP," www.nwfusion.com, DocFinder: 1741) — in spite of voice-over-IP bashing by those who prefer voice over ATM.

Henry Sinnreich
Staff engineer
WorldCom
Richardson, Texas

"VoIP to carry 'bandwidth tax'" is an insightful story. But the impact on monthly costs is questionable because in a modern company voice-over-IP traffic generally rides free on a midsize intranet's transmission facilities.

Roshan Sharma
Adjunct professor, electrical engineering
Southern Methodist University
Dallas

I enjoyed Joel Snyder's column "The VoIP push is premature" (www.nwfusion.com, DocFinder: 1742). However, I have a different opinion of the viability of voice-over-IP technology. Many manufacturers would have you think voice-over-IP technology is ripe for the desktop, but its most viable use is in campus or wide-area extensions of a voice network. For

instance, a school district with fiber, frame relay or 802.11b wireless connectivity can cost-effectively connect to remote locations and replace traditional voice services on a key system or PBX. This lessens the need for plain old telephone service lines and enhanced services that can come from the core PBX.

Douglas Knight
Via e-mail

In his column "The VoIP push is premature" Joel Snyder highlights four obstacles related to IP voice implementation in the company: scalability, Enhanced 911 (E-911) support, voice quality and the cost of IP phones. These are valid concerns, and many vendors in this segment are still working through these issues.

Although the perception may exist that no vendor has adequately addressed these problems, the reality is that Shoreline Communications already has.

Regarding scalability, Shoreline's IP voice communications platform is based on our Distributed Intelligent Voice Architecture, which lets the platform provide virtually unlimited scalability.

E-911 support is embedded in Shoreline's IP voice platform. We support the three proposed standards for E-911 support, including the ability to identify a user within 40,000 square feet, identify a user within a range of 48 phones, and identify a user down to an individual phone, regardless of where that user is located on the voice network.

In terms of quality, an independent test conducted by Mier Communications earlier this year showed that Shoreline had the highest voice quality of any IP voice system tested.

Regarding IP phone cost, we are committed to supporting any industry-standard device our customers prefer. We are partnering with vendors that will deliver IP phones at a price far below the \$400 to \$500 range Snyder mentions. Alternatively, customers can use off-the-shelf \$50 analog phones without giving up any of the functionality of the Shoreline platform.

I hope this provides a clearer picture of how at least one vendor is making IP voice communications a reality in the company today.

Franklyn Jones
Vice president of marketing
Shoreline Communications
Sunnyvale, Calif.

E-mail letters to jdix@nw.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

Mike Keefe 2000

www.nwfusion.com

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BEYOND WINDOWS AND LINUX: DISCOVERING THE BSDs

The computer industry can be a scary place. Products try to evolve carefully, but get caught in the publicity machine and quickly grow out of control. This year's poster child for too-fast growth is Linux. While many network managers have found Linux to be more stable and reliable than Windows 2000, they also have begun to worry about whether the hype machine will destabilize Linux. Into this picture steps Linux's lesser-known cousins, the Berkeley Software Distribution-based operating systems — FreeBSD, NetBSD, OpenBSD and BSDI.

The BSDs have been around for a long time — longer than Linux. But they have received much less attention than Linux in the press because they have fewer noisy supporters. Nevertheless, they continue to thrive, because of their similarities to, and differences from, Linux. Like Linux, the BSDs are free, fast and have a variety of software available for them. In addition, BSD kernels tend to be more stable than Linux kernels, BSDs run on a wider variety of hardware and have fewer security issues.

But where the BSDs tend to really shine is in networking. TCP/IP speed tests run on identical hardware often show the BSDs to be faster than Linux. While the Linux community has focused on enabling Linux to use more esoteric hardware, the BSD community has worked on making the network infrastructure faster and easier to extend. This has caused a number of network hardware vendors to use customized versions of BSDs, particularly NetBSD, as the internal operating systems of their commercial products.

As the lesser-known players in the free operating system market, the BSD development groups have had more opportunity to work on the core of their products. FreeBSD has the largest market of the BSDs and gets the most development interest. NetBSD runs on an incredible variety of CPUs, including some systems that leave even the fastest Intel chips in the dust. OpenBSD's main focus is security, and it attracts developers for whom that is the main concern. BSDI is the commercially supported mem-



ber of the gang, with fewer features but a well-established reputation for rock-solid products.

This year, some large hardware companies such as IBM and Dell have started shipping Linux preinstalled for customers who request it. None of the BSDs have gotten this type of attention. However, it is well known that many large Internet service providers use one of the BSDs (FreeBSD) to run their production mail and Web servers. It is common to find BSD-based Internet servers that have not crashed or been rebooted in years.

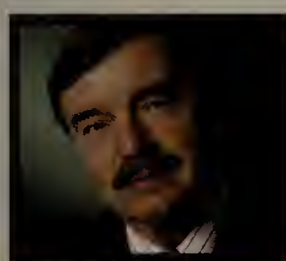
This is not to say that Linux shouldn't be considered for serious network tasks. But any shop that is considering Linux should also take a look at the BSDs, particularly if they want stability and less excitement in their operating system.

Hoffman is director of the Internet Mail Consortium and the VPN Consortium. He can be reached at phoffman@imc.org.

Reality Check . Thomas Nolle

SO IS OPTICS REALLY JUST HYPE AFTER ALL?

The recent meltdown of fiber-optics companies on Wall Street raises troubling questions about one of the most fundamental assumptions of our industry: Bandwidth needs are exploding, and networks will have to change to respond to this trend. While many may scoff at giving Wall Street bean counters a deciding vote in the future of networking, we have to remember that these guys are going to have to



finance any major changes in infrastructure and any new service providers. Are they right that optics is overblown?

One indication that Wall Street is right is that optical components and fiber are being promoted as higher-growth opportunities than the equipment that would incorporate these components and the service networks that would use that equipment. Service opportunity equals demand. Demand equals new devices. New devices equals new components. Well, service provider stocks have generally been tanking, and the major equipment players such as Nortel Networks, Lucent and Cisco have also fallen. Does the optical market fail this very first test of financial sanity?

Not really. The problem is that we're looking in the wrong place. There is a service provider segment that's doing quite well — the regional Bell operating companies (RBOC). RBOC data services are growing at more than 30% per year at a time when the most data-centric of the interexchange carriers, WorldCom, has reduced its data earnings

estimates. What's more, this service provider segment is buying fiber equipment. This year alone, thousands of new fiber remotes have been deployed. In all, the fiber remote market will generate more than \$30 billion in sales. Who got the deal? Primarily Alcatel — which has its own fiber-optics components unit.

Alcatel and Marconi, two offshore equipment giants, have quietly eaten the lunch of our domestic equipment players in the fiber remote market. Alone among the big name fiber players, these two firms have focused on fiber in the outside plant or access network, rather than the fiber core. As DSL deployment by the RBOCs expands, remote fiber concentrators for DSL lines explode. The international players have been ready for this, as domestic players missed the signals of their own buyers.

If our equipment vendors have been dumb, we can't claim as a market to have been much smarter. We neglected another truth: You can't get onto a high-bandwidth network through a tin can and string. Access bandwidth reform is a precursor to any major expansion in core bandwidth requirements because without a fast delivery infrastructure, you can't sell high-bandwidth services even if the core can create them.

What we're seeing now isn't the death of optics, it's the birth of optics. First, improvements in the access network will increase the deliverable quantity of bandwidth. We can expect to see access bandwidth explode by a factor of 100 in the next four years. During that time, most of the optical investment will go to fiber remotes.

Access modernization will enable service modernization, which will enable core network band-

width expansion and technology change. Forget the Internet as a driver; even for WorldCom it was only about 10% of revenue. We don't really have a handle on what the service drivers will turn out to be; VPNs, perhaps content — more likely, both. Eventually they'll increase our core bandwidth by that same factor of 100. As this happens, core optical capacity growth will drive considerable deployment of new optical gear.

So what's the problem? Our demand for instant and continuous gratification. We want the technology equivalent of the storm of the century every year. RBOC fiber isn't exciting to us because the RBOCs are the same old telephone companies we've always known. Venture capitalists don't want RBOC fiber either, because they don't fund RBOCs. Core fiber explosions in four years aren't exciting either and don't promote a fast profit.

Here's the choice. We can entertain ourselves with fancy stories of new-generation networks built on a financial house of cards, with no credible revenue behind them, and watch as Wall Street pulls its money out of technology, or we can face reality and recognize that we're in the process of modernizing an industry whose scale dwarfs the gross domestic product of some countries. This is going to be done smart, right and slow.

Taking the long view used to be respectable in financial and technology matters. All we have to do to recognize the value of optics is to make long views respectable again.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

Hosts vs. the hosts

Web hosts are going far beyond simple collocation to offer an all-you-can-eat buffet of managed services.

BY KIMBERLY B. CAISSE

WHEN AMERICAN FLORAL SERVICES, one of the three largest floral wire services in the U.S., was looking for a Web hoster about 18 months ago, it wanted more than just a place to store its Web servers.

Chief Technical Officer Terry Byers was looking for a partner who could help the Oklahoma City company create and operate a Web site that would handle mission-critical ordering and delivery services for its 24,000 North American and 55,000 worldwide affiliates.

Byers says she chose IBM Global Services for two reasons. "One, we had a good relationship with IBM going into the selection process. And two, I believed it had more experience in running high-end, e-commerce applications than its competitors at the time."

Here's what IBM Global Services does for AFS: systems operations, systems administration, application monitoring, load balancing, hardware upgrades, integration with back-end applications, even consulting.

That's a far cry from simple collocation, in which the Web hoster provides power, lights, network bandwidth, rack space and physical security, while the customer supplies its own server, sets it up, and assumes responsibility for maintenance, repairs, upgrades and the like.

And that's the trend in Web hosting; the move from simple collocation to managed services.

Joel Yaffe, an analyst at Giga Information Group, says the earliest Web hosts were traditional carriers, then came specialized hosting providers such as Exodus and Global Center. And two to three years ago, managed hosting providers such as Digex arrived on the scene offering a medley of services for the horde of dot-coms that needed to get on the Internet fast and didn't have their own internal resources.

For example, Insurance.com, an Internet start-up affiliated with Fidelity Investments, wanted more than simple collocation services when it signed on with Exodus in January.

"We were looking for monitoring services," says Paul DiNicola, vice president of operations.

NUMBER OF U.S. DATA CENTERS

AT&T	7
Digex	4
Exodus	18
Genuity	8
GlobalCenter	4
IBM	13
Quest	11
UUNET	6
Verio	12

WEB HOSTER MENU



SPACE OPTIONS

AT&T	Individual locking cabinets, rack cages, custom cages.
Digex	Minimum one-server configuration.
Exodus	Cages start at 8-foot-by-7-foot.
Genuity	Varies.
GlobalCenter	Half-rack to custom cages.
IBM	Half-rack minimum.
Quest	One-quarter rack minimum.
UUNET	Half-rack to custom cages.
Verio	One-third of 19-inch cabinet to private suite

HOSTING OPTIONS:

(collocation, managed dedicated server, managed space on partitioned server)

AT&T Collo, dedicated, shared.

Digex Dedicated.

Exodus Collo, dedicated, shared.

Genuity Dedicated, shared.

GlobalCenter Dedicated.

IBM Collo, dedicated, shared.

Quest Collo, dedicated, shared.

UUNET Collo, dedicated, shared.

Verio Collo, dedicated, shared.

MANAGED SERVICE OFFERINGS:

AT&T Intrusion detection, vulnerability assessment, private data networks.

Digex Administration, monitoring, reporting, security, backup for Web and database servers. Upgrades, dynamic failover for databases, performance testing, security scanning, vulnerability assessment, digital certificates, load balancing, RAID storage, storage-area networks, firewalls, high-availability platforms, streaming media.

Exodus URL monitoring and events log, system administration, load testing, performance optimization, rebooting, bandwidth reporting, performance trend reports.

Genuity Site clustering with RAID arrays, load balancing, firewall, VPN and Domain Name System administration, load testing.

GlobalCenter Monitoring.

IBM Monitoring, reporting, service management, network management, database services, application management.

Quest Application management, preproduction testing, security services, site performance and tuning, retail services for e-commerce sites.

UUNET Server and application monitoring, bandwidth reports, trouble-ticket information, usage reports, performance monitoring.

Verio Network availability monitoring, bandwidth metering, data backup and recovery.

WHO OWNS THE EQUIPMENT?

AT&T Collocation customers own, managed hosting customers lease.

Digex Digex.

Exodus Primarily customers.

Genuity Purchase, rental or lease/purchase options.

GlobalCenter Customers.

IBM Bring your own, buy from IBM or lease.

Quest In most cases, customers.

UUNET Collocation customers own, managed hosting customers lease.

Verio Purchase and lease options.

HOW MUCH DOES IT COST?

AT&T For large enterprise managed dedicated hosting, start-up cost is \$1,000, monthly cost is \$2,500.

Digex Depends on customer configuration, but average monthly revenue per server is \$3,780.

Exodus Varies.

Genuity Varies.

GlobalCenter Varies.

IBM Varies.

Quest Collocation starts at \$395 per month for one-quarter rack and \$1,718 per month for 10M bit/sec burstable bandwidth.

UUNET Collocation starts at \$900 per cabinet plus bandwidth charges; shared hosting \$300 to \$700 per month; dedicated hosting starts at \$1,500 per month.

Verio Shared hosting starts at \$24.95 per month.

SERVICE-LEVEL AGREEMENT OFFERINGS:

AT&T Standard SLA is 99.9% network uptime, 99.7% server uptime for managed services.

Digex Negotiable

Exodus 99.97% availability for Exodus network and every service that affects site performance.

Genuity Black Rocket SLA: service within 10 business days and 99.9% availability for Internet and VPN. General hosting SLA: 99.9% network uptime per month, 99% server uptime per day, no greater than 10% packet loss in 10-minute period. High-availability SLA: 100% network and server uptime.

GlobalCenter Negotiable.

IBM Negotiable, up to 100%.

Quest 100% availability if end-to-end Quest network.

UUNET Less than one hour per month.

Verio 99.9% server uptime, rebate if network outage exceeds 60 minutes.

NO MSG OR PRESERVATIVES ADDED

Currently, Exodus monitors Insurance.com's firewalls, bandwidth usage, routers, traffic load balancers and other hardware.

Insurance.com chose Exodus mainly because it's the collocation company for Fidelity Investments, DiNicola says. "The commitment was there, and Exodus was ready to make it work. Exodus has the resources we need to pull this off."

"Managed service providers make certain that Web sites run," says Jeanne Schaaf, senior analyst at Forrester Research. More users are seeking managed service providers "as their Web site becomes a more critical venue for them," she says.

The list of services you can expect to choose from includes Web site design, capacity planning, testing, application monitoring, security monitoring, storage management, content distribution, load balancing, bandwidth utilization, reboot capability, clustering, multilayered redundancy and site mirroring.

And hosters that don't yet offer a complete suite of managed services are scrambling to provide them. For example:

- In early September, WorldCom bought Intermedia for \$6 billion because of its 55% majority stake in Digex. WorldCom wants to add Digex's managed services to UUNET's ISP business.

- Exodus, the industry leader known for its collocation services, is talking up its list of managed services. "We offered monitoring right from the day the company started collocation services in 1996," says Prabakar Sundarajan, vice president of technology. "We have been expanding on it ever since. It's really second nature to the business."

- Verio plans to open seven to 10 new data centers this year to offer more sophisticated services to customers. These centers will feature shared, dedicated and collocation hosting as well as managed services. Verio, which focuses on small to midsize businesses, is now part of NTT Communications, a Japanese telecommunications company and ISP.

"What we find is more and more customers are looking for very sophisticated telco/data centers," says Doug Schneider, president of

Web services at Verio. "NTT allows us to invest in the business at a much greater rate than we could have in the past."

- GlobalCenter, the Web-hosting arm of Global Crossing, plans to add a variety of managed services in the next six to 12 months, says Derek Chang, co-chief operating officer and chief financial officer. "You'll see a breadth and depth of products that will position us to serve our customers' complex needs," Chang says.

- In September, Exodus placed a bid to buy GlobalCenter in a \$6.9 billion stock deal. GlobalCenter will increase Exodus' customer base and data center locations more than it will give Exodus additional high-end managed services, Giga's Yaffe says.

Utility players

Ultimately, hosters want to be seen as another utility that provides on-demand services. The idea is that you'll be able to call your hoster to order more storage, for example, and have it available in less than one hour.

"We are all looking at how we can deliver certain parts of the hosting service in a utility approach," says Mitch Ferro, director of hosting products for UUNET. The company is developing on-demand services for things such as storage and Web servers, which it plans to unveil in the next six months. "It will get our customers to market much more quickly, but also our customers can scale their sites much more quickly," he says.

Meanwhile, GlobalCenter, Exodus and AT&T are already offering storage and bandwidth on-demand. AT&T's Business Ready Dedicated Hosting Service, which was launched in August, promises to provision a Web server and e-commerce tools within 30 minutes of an order. "It is aimed at putting on a Web-hosting environment within a matter of hours rather than a matter of days," says Jenny Proctor, director of AT&T Dedicated Hosting Service.

Caisse is a freelance writer living in Massachusetts. She can be reached at kimberly.caisse@hushmail.com.

Mum's the word on Web hosting locations

BY KIMBERLY B. CAISSE

If you decide to host your company's Web site with Exodus Communications and want to pay your project manager a visit, expect to get lost because there are no signs on the building announcing that Exodus is doing business inside.

That's because one of the key factors driving the industry's most successful Web hosting company is a healthy dose of paranoia. It tries not to leave anything to chance, starting with exactly where its data centers are located.

Inside Exodus' Boston 2 data center in Waltham, Mass., you'll walk through a bulletproof-glass entrance to get to the check-in area, where you'll be greeted by security officers. They will kindly ask you to fill out a form telling them who you are, what company you work for and what kind of car you drive. You'll notice the people in front of you handing their drivers' licenses and the form to the officers. Go ahead and do the same. Once they check to see if you're on the list of

daily visitors and give you a pre-made name tag, you'll be instructed to knock on the door leading to the data center floor.

On the other side of the door is another security officer, who makes sure you're wearing a name tag and have someone on the Exodus staff to escort you through the data center. After that checkpoint, you'll walk through another door to get to the data center.

First, you'll walk by the network-operating center. This room, shrouded in tinted glass, hosts Exodus' help desk staff. The main floor of the data center has white tile floors and rows upon rows of black chain-link cages.

A standard cage is 8-foot-by-7-foot, but customers can buy more cage space. They can buy less only by sharing a cage with other customers' equipment or filling a cabinet, which sits outside the cage system. Some customers buy waterproof vaults, which are so secure that the tiles are screwed down and the equipment is hidden. Security cameras are focused on all

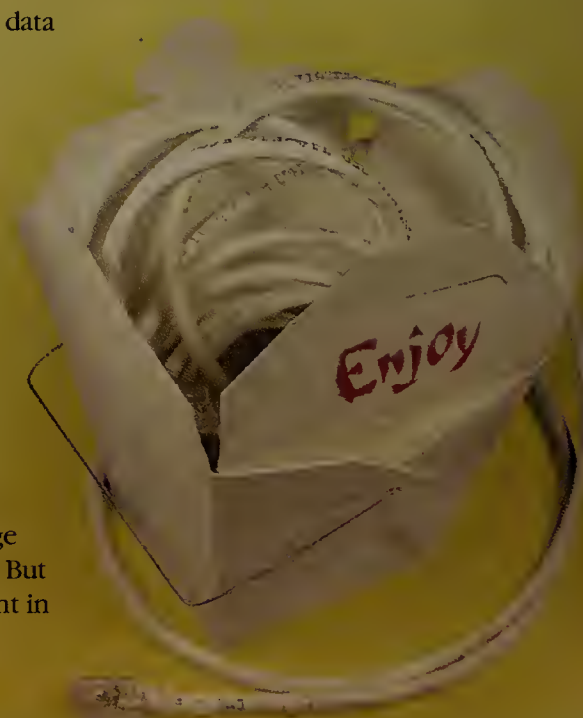
the cages.

To get through the doors and roof hatches, employees must be "badged in." Only security has access to the cages. "As a Platinum engineer, I don't have keys to any cages," says Patrick Hetherington during a facility tour. "I have to go to security to get them."

As you walk through the data center, you'll notice a room with racks full of large switches and many thick wire lines. This is the node room. It houses the Cisco and Foundry Networks gear that provides Ethernet, Fast Ethernet and Gigabit Ethernet feeds to the backbone network.

And don't forget to take a sweater. If your cage or cabinet is in an area full of servers, switches and storage cabinets, you won't need it. But if you locate your equipment in a less-populated part of the data center, you will. Exodus' staff of engineers

and facility managers try to keep the temperature in the data center between 68 and 72 degrees. These people are as fanatical about temperature as the officers are about security. In fact, sometimes you'll see industrial fans blowing on equipment that's generating too much heat. ▀



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New kids offer high-end services

Some new players are gaining ground because of their approaches to the latest sweet spot of the market: managed services.

Intira:

Intira calls itself a "netsourcing" company. Based in Pleasanton, Calif., it targets established companies with mission-critical Web requirements. "We usually work with a mature management team that understands their strengths and weaknesses," Chief Technology Officer John Steensen says.

Intira owns all the equipment necessary to run e-commerce sites: the Web servers, application servers, database servers, firewalls, switches and routers. Intira customers own and operate their own applications.

Intira was started to address the mission-critical nature of e-commerce, Steensen says. So when a site has a problem, Intira engineers and developers assume something is wrong with the Intira equipment. "We don't argue about it up front," he says. "We just get the problem solved. It's what [customers would] expect from their own IT [staff]."

Intel Online Services:

Intel Online Services (IOS) has a similar setup, but calls itself a fully managed services company. IOS offers a variety of services from negotiating vendor contracts to storing software licenses to providing the staging environment for Web sites. "All customers have to do is load their content," says David Rowe, director of services planning at IOS in Santa Clara.

IOS is not a typical Web hoster. "If you walked into an IOS data center, you wouldn't see any cages," he says. "Because we manage everything for you, we don't have to use cages." Only IOS staff is allowed in the data centers.

In addition, customers lease, rather than buy, the equipment and software for their Web sites.

"Some customers don't want to invest in the equipment and applications to build the proper e-commerce site because they're unsure how successful they will be on the Web," Rowe says.

LogicTier:

LogicTier's approach to Internet outsourcing is much different. The San Mateo, Calif., company expects its customers to "come with their sense of brand, sense of who their end-users are, and their custom business logic, and plug it into the LogicTier infrastructure," says Omar Ahmad, co-founder and chief technology officer.

"The process of trying to figure out which servers to run, where you need to place your system, how much stuff you need and how fast you need to grow is part of LogicTier," he says. Instead of owning data centers like Intira and Intel Online Services, LogicTier leases space in some Level 3 Communications and AT&T data centers.

High performance is important to LogicTier. Once a site is running, engineers start sending out software agents that mimic end-user behavior and attach themselves to various network backbones, Ahmad says. This verifies a site's performance against the service-level agreement.

"It's really for folks who require high performance and high demands on the systems," he says. ▀

To host or not to host

Going with a Web hoster is not for everybody. Gartner Group analyst Audrey Apfel says Web hosters are a good idea for the majority of companies because Web hosters offer efficiency, reliability and a range of services.

But she says Web hosting is not recommended for companies whose business models rest on an innovative Web application or who have extremely complex integration issues.

The use of Web hosters is increasing, according to Forrester Research. In 1998, 44% of users interviewed by Forrester out-

sourced their Web sites. The number of companies that say they outsource has since climbed to 62%.

But Joel Yaffe, an analyst at Giga Information Group, says he's seeing a countertrend, in which some companies are bringing their Web sites back in-house. "It's mainly companies that already have heavily integrated business systems — manufacturers — or are in industries that are regulated — financial services, health care and pharmaceuticals — that are bringing their Internet activities in-house," he says. ▀

How to select a Web hoster:

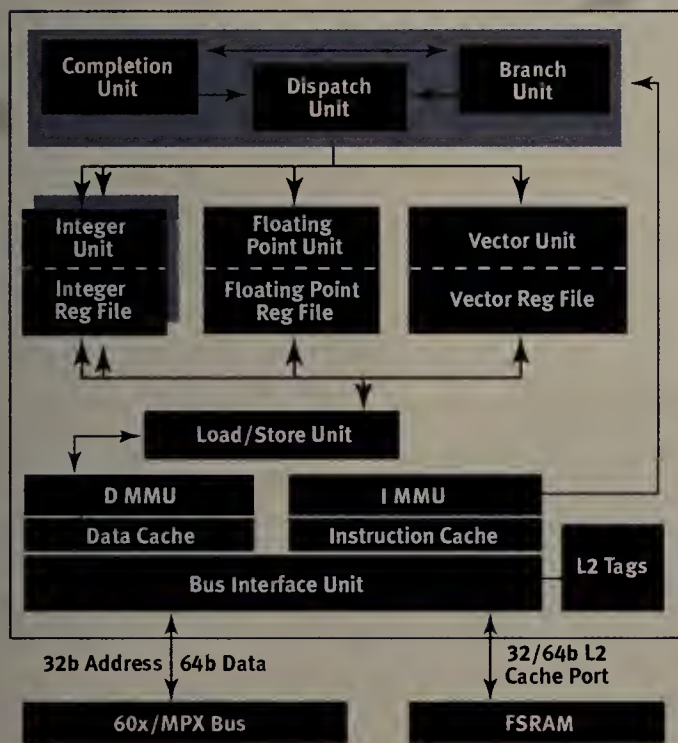
1. Look for a data center that has a secure, available high-performing network.
2. Find out what managed services the Web hoster has, and also find out what additional services are being planned.
3. Be sure service-level agreements (SLA) are realistic, which means "shared pain" in the event of an outage. For example, if your Web site is down and you lose millions of dollars, an SLA in which the vendor doesn't charge you for the time the network was down doesn't really represent "shared pain." A better SLA would have escalation clauses that call for double, triple and quadruple penalties for repeated outages in a predefined time period.
4. Make certain you receive timely reports that track the hoster's performance.
5. Investigate whether the Web hoster has the ability to attract, retain and train staff.
6. Find out what the Web hoster's track record is with sites similar to yours.
7. Make sure you have exit clauses and transition assistance nailed down in advance, so you know that your site will be protected if you decide to switch hosters.

You will change careers
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MPC7410 Block Diagram

	MPC7410 400-500 MHz
CPU Speeds - Internal	400, 450 and 500 MHz
CPU Bus Dividers	x3, x3.5, x4, x4.5, x5, x5.5, x6, x6.5, x7, x7.5, x8, x9
Bus Interface	64-bit
Bus Protocol	MPX/60x
Instructions per Clock	3(2 + Branch)
L1 Cache	32-Kbyte instruction 32-Kbyte data
L2 Cache	512 Kbyte, 1Mbyte, or 2 Mbyte
Core-to-L2 Frequency	1:1, 1.5:1, 2:1, 2.5:1, 3:1, 3.5:1, 4:1
Typical Maximum Power Dissipation	5.5W/12W @ 500 MHz
Die Size	52 mm ²
Package	360 CBGA
Process	0.18μ 5LM CMOS
Voltage	1.8V internal, 1.8/2.5VI/O
SPECint95 (estimated)	22.8 @ 500MHz
SPECfp95 (estimated)	17.0 @ 500MHz
Other Performance	917 MIPS @ 500MHz
Execution Units	Integer(2), Floating-Point, Vector, Branch, Load/Store, System

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Drive image copiers have saved the lunch, dinner and weekend of many system administrators by letting them easily install complex system software on PCs. What has been missing is a server drive-imaging product.

A few years ago, PowerQuest introduced ServerMagic, a server equivalent of its popular PartitionMagic. ServerMagic lets you change the size of server partitions, copy or move server partitions — even from one drive to another — and perform other tricks. ServerMagic was even shipped with NetWare and Windows NT versions in the same box. While it wasn't a drive image copier, it was a step in the right direction.

Similar features could be found in Symantec's Norton Ghost for NetWare. But when we approached Symantec about reviewing it, we were told the company was no longer actively marketing it.

The ServerMagic package includes the programs ServerMagic, ServerImage, Boot Disk Builder and RemoteAgent. The ServerMagic program lets you manipulate server partitions; ServerImage lets you create and deploy server images; Boot Disk Builder creates boot diskettes for RemoteAgent; and RemoteAgent lets

More magic for NetWare users

Copy your server disk images quickly with ServerMagic 4.0.

BY MIKE AVERY

to ensure data integrity. We wish PowerQuest would look into ways to avoid dismounting all volumes as soon as the programs are started. The use of an open file manager could all but eliminate the need to dismount the volumes.

The new features, those that will cause system managers to sit up and take notice, are the ability to connect

purpose other than upgrading, or migrating, a server from one computer to another requires another ServerMagic license.

Fun with ServerImage

Another new feature is the ServerImage program. It is similar to PowerQuest's DriveImage Pro, except it recognizes NetWare partitions, their structures and free space. Because it installs and runs under DOS, as do all disk-imaging products, it is installed on the DOS partition of the server you want to image. As system manager, you will need to load any special drivers DOS needs to access your hard drives. Once installed and run from DOS, ServerImage can image any partition on your server to a drive in the server, or on any other server you can connect to from DOS.

We created an image of our DOS partition and the NetWare partition that contained the SYS volume. Because many system managers have very customized (and underdocumented) NetWare setups, they are concerned that in the event of a system failure, recreating the setup and getting to the point where their back-up systems can complete the job could take days. After we imaged our server, we felt a profound sense of relief. We could — and did — reinstall NetWare the way it was when we imaged our server, including our ready-to-use back-up system.

The other new program, Boot Disk Builder, lets you create boot disks to boot a system with RemoteAgent so a server running ServerMagic can control it. This is a very important feature, especially if you have system managers who've never had to create a DOS boot diskette. The program can boot the system and establish a

TCP/IP connection to the server running ServerMagic. The program looks the same as the diskette boot builder PowerQuest includes with DriveImage Pro. It supports a number of network interface cards as delivered, and it is easy to add additional NICs to the boot diskette builder, which helps a system manager support newer devices. However, where the DriveImage Pro version of the program lets the diskette detect a large number of NICs and automatically loads the correct drivers, the ServerMagic version only handles one NIC per diskette. Because most system managers have a good idea of what NIC is in each of their servers, this isn't a very serious issue, but it would still be nice if multi-NIC support were included in the RemoteAgent Boot Disk Builder.

There were some grammatical errors in the book, and in some places the documentation instructions were confusing. The errors were easy to sort out, but it would have been better to not have to.

Despite the errors in the manual, installation was straightforward. Each part of the package required a separate installation. This might seem somewhat tedious, but each component runs in a different software environment, so a fully integrated installation would be a bit much to ask.

PowerQuest's ServerMagic is a powerful tool that will let you perform low-level maintenance on NetWare servers quickly, efficiently and safely.

Avery is the founder of Golden Triangle Network Consultants, specializing in network design, management and administration. He can be reached at mavery@mail.otherwhen.com

NetResults

ServerMagic 4.0 for NetWare

RATING: 8.00 **COMPANY:** PowerQuest (801) 226-8941, www.powerquest.com **COST:** Starts at \$4,495 for single-user license. **PROS:** Allows easy maintenance, duplication and deployment of NetWare disks. Being able to quickly restore a NetWare server is a godsend for system managers. **CONS:** Still requires that server volumes be dismounted, which is an inconvenience.

	Feature set 40%	Management 20%	Installation 20%	Documentation 20%	Total score
ServerMagic 4.0 for NetWare	9	7	8	7	8.00

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Scoring key: 10 — Can't be better; 9-8 — Excellent; 7 — Very good; 6-5 — Average; 4-2 — Needs improvement; 1 — Not supported or doesn't work.

you perform ServerMagic functions on other servers.

The ServerMagic program runs on NetWare 3.2, 4.X and 5.X servers. It installs like most NetWare server resident applications, through the menu of the NetWare Install NetWare Loadable Module. It installed in seconds; mounting the CD-ROM on our server took longer than the rest of the installation. Once installed, we could resize partitions, create and delete partitions, and merge adjacent volumes on the server. As with earlier versions of ServerMagic, the first thing it does is dismount all volumes on the server. While inconvenient, this is necessary

to remote servers running RemoteAgent and control them the way ServerMagic can work with a local NetWare drive. Although some lower-level functions were missing, such as the ability to resize NetWare volumes, we were able to copy a NetWare volume from one server to another. This was faster than using XCOPY, NCOPY or NetCopy. However, it meant that two servers had to be offline during the operation. Still, this gives you the ability to quickly duplicate systems or partitions on a system. One of RemoteAgent's primary uses is to allow quick system migrations to new hardware. Using RemoteAgent for any

How we did it

We tested PowerQuest's ServerMagic on two Novell IntraNetWare 4.11 file servers. One was a 350-MHz AMD K6-2 based system with a SCSI disk subsystem, the other a 450-MHz AMD K6-2 system using IDE drives. Both used standard Intel Pro 100 Server network interface cards. We looked at ease of use, features and data reliability. While we didn't encounter any data corruption problems, we weren't expecting any in this short a test. We installed ServerMagic on one server and used the ServerMagic Remote Agent on the other server to test cross-server functions. We also tested ServerImage on both machines, although we only restored images on the 450-MHz server.

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The PowerEdge 6400, Dell's latest iteration in its multi-processor server line that features four Pentium III Xeon processors, showed great performance numbers and good management features.

But it falls down in serviceability features, which means it's hard to fix in a pinch.

The PowerEdge 6400 is a 7U box that can be mounted in a 19-inch rack or used in a stand-alone configuration. It is built using the Intel ServerWorks Enterprise ServerSet III HE chipset. This chipset supports the latest Pentium III Xeon processors, Synchronized Dynamic Random Access Memory and 66-MHz PCI slots.

The PowerEdge 6400 earned an overall score of 8.5 out of 10. This is the first four-way server we have tested using our new server testing benchmarks (see How We Did It, www.nwfusion.com, DocFinder: 1821). But if you compare it to the results from the Hewlett-Packard LT6000 server — which had six 550-MHz CPUs — we tested earlier this year (www.nwfusion.com, DocFinder: 9923), the PowerEdge 6400 proved to be a strong contender in performance. It showed 88% of the HP LT6000 six-way server's performance across our CPU-intensive database and network tests with two fewer CPUs.

The PowerEdge 6400 sustained 0.8

Dell four-way server scores on performance

But the PowerEdge 6400 isn't designed to make it easy to service the server in a pinch.

BY JOHN BASS,
NETWORK WORLD GLOBAL TEST ALLIANCE

transactions per second in our CPU tests with NetWare 5.1 as the underly-

ing operating system, 1.49 transactions per second with Windows NT 4.0, and 1.51 transactions per second with Windows 2000. In our network tests, the PowerEdge 6400 sustained 1,686 transactions per second with NetWare 5.1, 7,846 transactions per second with NT and 8,085 transactions per second with Win2000. These results are about 80% of what the HP LT6000 achieved.

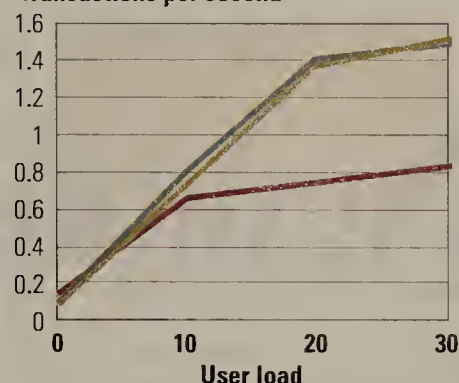
The PowerEdge 6400 marginally outperformed the six-way HP LT6000 in our file tests (See online file performance charts, www.nwfusion.com, DocFinder: 1822), scoring about 6% better overall than the HP server — not bad for a four-way server. This increased performance is likely due to the faster 15,000 rpm Ultra 3 SCSI drives.

The PowerEdge 6400 earned fairly high marks for flexibility, which is an assessment of a server's options for

The Dell PowerEdge 6400 server pushes performance

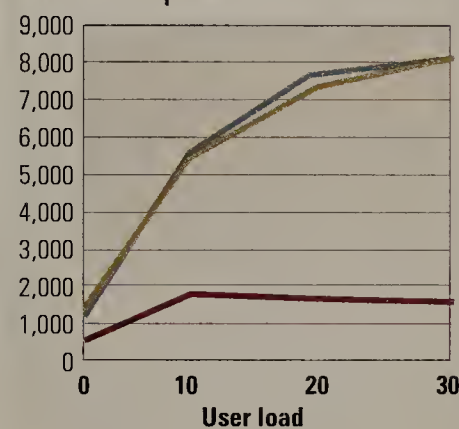
CPU Test Results

Transactions per second



Network Test Results

Transactions per second



— NetWare 5.1
— Windows 2000
— Windows NT Server 4.0

Feature and configuration table

Vendor	Dell
Price	\$32,097
Processor type	Pentium III Xeon 700MHz with 2M-byte cache
Number of processors	4
Total number of processors supported	4
Memory configuration	2G byte (16 128M-byte DIMMs)
Number of RAM slots	16
Expansion slots present	Two 64-bit 66MHz, four 64-bit 33MHz, one 32-bit 33MHz
Expansion slots available	4 PCI
Disk controller	Dual 7899 Ultra 3 SCSI, Single 7880 ultrawide, Perc2-dc 128M-byte battery-backed cache
Hard disk description	Two 9.1G byte, 10,000 rpm for operating system at RAID-1 and eight 18.2G byte, 15,000 rpm for data at RAID-0
Number and description of hard disk bays	Eight 1-inch slots hot plug 1x8 can be in 4+4 (1.6-inch going away), two 1-inch slots hot plug
Network interface	Intel 82558 Intel pro 100+ based, one built-in (supports load balancing and failover), one PCI, one dual PCI
CD-ROM	SCSI 40x NEC connected to the 7880 UW SCSI controller
Availability features	Hot-pluggable disk, redundant power, redundant hot-pluggable system fans, chip kill which allows operation with failure of RAM DIMM
Manageability features	Dell Server Assistant Version 6, IT Assistant, Resolution Assistant, Open Manage connections supports Unicenter, Tivoli and OpenView
Security features	Lock for lid of server and for front bezel, BIOS passwords, passwords for management tools
Bundled software	Dell Server Assistant, application CD
Warranty	3-year on-site, 3-year parts

Dell PowerEdge 6400

Performance 40%	10.0
Features and flexibility 30%	8.0
Manageability 20%	7.6
Serviceability 10%	5.8
Total	8.5

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Scoring key: 10 — Can't be better, 9-8 — Excellent; 7 — Very good; 6-5 — Average; 4-2 — Needs improvement; 1 — Not supported or doesn't work.



only requires one reboot for Novell, Win 2000 and NT. The IT Assistant tool can manage all Dell servers remotely or locally. Resolution Assistant, also a new tool, lets the administrator access Dell's support team directly from the server. Dell's sup-

port team can remotely troubleshoot the server through Resolution Assistant if the administrator grants Dell the permission.

While it is easy to add and remove PCI cards, power supplies, fans and hard drives, servicing this machine beyond these

tasks is difficult. The CPUs and RAM modules are hard to service because the access cover is difficult to manipulate. The motherboard is also hard to access. The I/O cage, CPU and RAM subsystems are incorporated into one monolithic

cage that can slide out the rear of the unit to expose the motherboard. The problem is removing the power and data cables to free the cage. Some cables are also hard to reach. Adding and removing expansion components other than RAM is easy, but fixing this server under the pressures of a catastrophic failure would be frustrating.

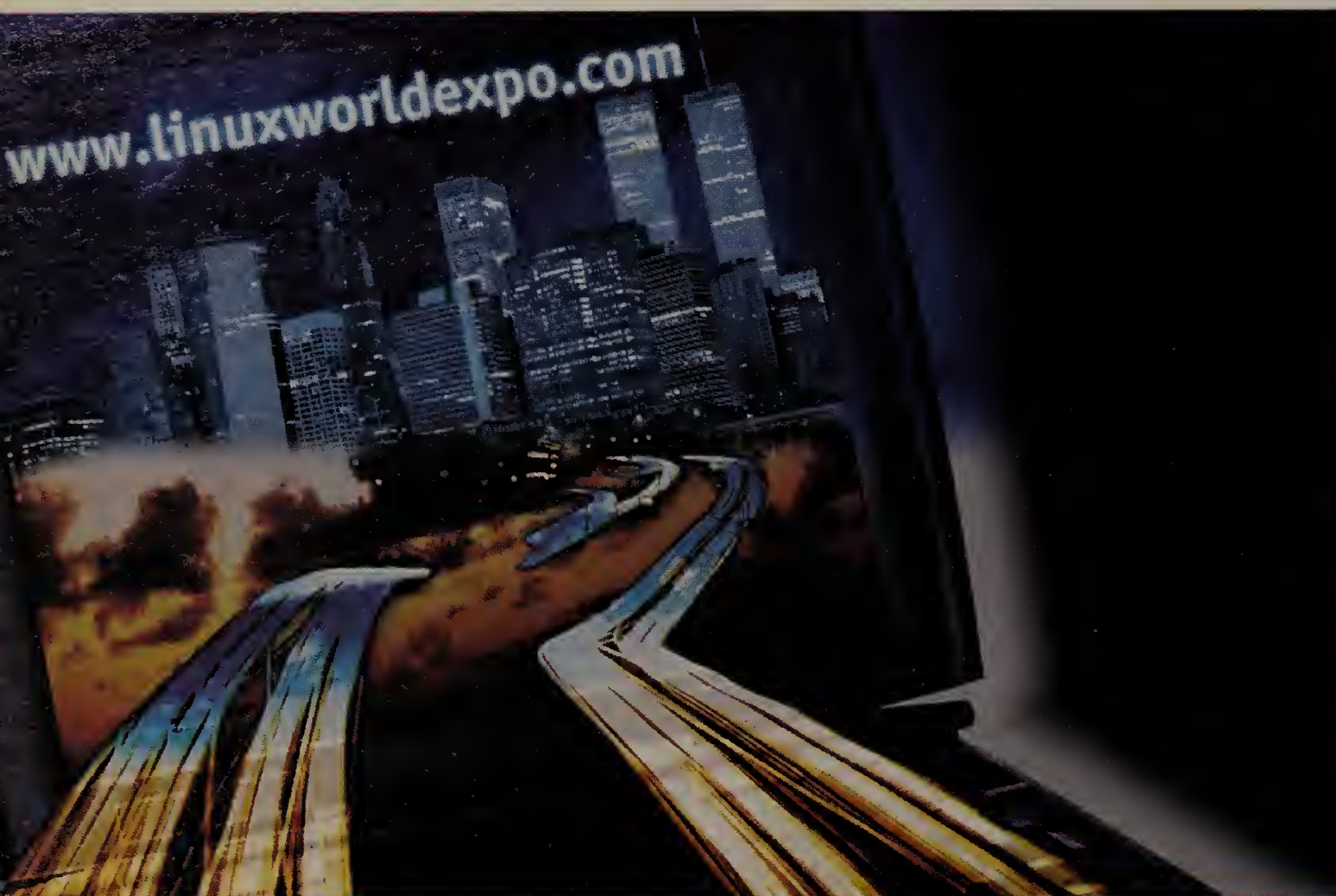
The PowerEdge 6400 came configured with two mirrored 9.1G-byte hard drives to handle the operating system and eight 18.2G-byte hard drives for storage.

The Dell PowerEdge 6400 is a solid performer with good expansion capability and management features. But serviceability could use some attention from Dell, as this server is based on the same chassis design we reviewed a few years ago. It's time for a rework of the chassis design to provide serviceability the market has come to expect.

Server testing is performed at North Carolina State University's Centennial Networking Labs (CNL) in Raleigh, N.C. CNL tests network equipment and network-attached devices for interoperability and performance. Bass, a senior technical staff member at CNL and co-author of McGraw Hill's Building Cisco Multilayer Switched Networks, designs and leads the execution of the test suites. He can be reached at john_bass@ncsu.edu.



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Feature Presentation: The Golden Penguin Bowl

Hosted by: Nick Petreley, Linux Evangelist for Caldera Systems,
Contributing Editor for LinuxWorld and InfoWorld Magazines

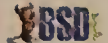
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Bass is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the networks industry; each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.



Management

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Student staffers

Companies are turning to co-op students and interns to help ease the IT labor crunch.

BY JASON MESERVE

Imagine getting a summer job in the ultimate tropical paradise, Hawaii, with free use of a large house and accompanying pool that you share with fellow twenty-something co-workers. If you're thinking this is the premise for the latest incarnation of MTV's "The Real World," you'd be wrong.

A group of interns lived out this scenario while spending the summer working for Viata Online, a Honolulu firm that builds travel transaction systems. The company hired interns from such top schools as Carnegie Mellon, Harvey Mudd, the Massachusetts Institute of Technology and Stanford University to build the majority of the firm's software.

Like the U.S. mainland, Hawaii faces a crunch when it comes to hiring IT workers. Though beautiful and warm year-round, the island has a high cost of living — a prohibiting factor to attracting talent. To fill gaps in its 50-person workforce, Viata has turned to interns and cooperative education students.

"Being a start-up, we don't have a lot of money, but we need talented people to get the job done quickly," says Jay Abel, chief technology officer of Viata. The intern arrangement has worked out well for the firm. "Our students are craving real-world examples and want to play with stuff they learn about in school. They're sharp young minds that hold a lot of information."

Cooperative education usually involves a student spending part of the school year working full-time and the rest of the time in a traditional classroom setting.

Approximately 241,000 undergraduate students participate in co-ops at some 117,000 work sites in the U.S., according to a 1998 survey from the Cooperative Education Association (CEA). The CEA also reported about 600 schools offer some type of co-op program.

Northeastern University, the founder of one of the first co-op programs, says it places about 6,000 students per year in co-op positions. Other schools that emphasize co-ops include San Jose State University, Drexel University in Philadelphia and the University of Waterloo in Canada.

Handango, a handheld software vendor in Hurst, Texas, is taking advantage of interns to help fill job spots. "There's a tremendously well-publicized scarcity of technical resources in the world.... There's too many jobs and too many open reqs," says Clint Patterson, vice president of product management at Handango.

The company currently uses seven interns, including Edward Phillips, a sophomore computer science major at the University of North Texas in nearby Denton. Phillips helps with the daily maintenance of Handango's Web site, while higher-level designers work on more abstract tasks.

Phillips says the stint at Handango is a valuable resumé builder. Employers benefit, too, by gaining eager workers who can be hired for relatively low wages compared with those who have completed their degrees.

At Computer Associates, technical co-op students and interns earn an average of \$12 per hour, says Joe Burger, manager of enterprise networking at CA in Islandia, N.Y. They also get perks such as free breakfast and a T-3 line to the Internet for Napster, he adds. Burger says his interns were instrumental in configuring workstations as part of a VPN rollout.

But cheap talent isn't the only reason for adding students to the payroll. "I look at it from this perspective:

You get in early on a kid that could be a rising star," says Ed Wolff, vice president of human resources at Interland, a Web hosting firm in Atlanta. "We need to start early and get in front of these folks before others do."

The downside to hiring co-op students or interns is that they work for short periods of time — usually a few months — before heading back to the world of academia. Managers say it's essential to hire self-starters who are eager to learn new things and can work in a team. Preparation and guidance are key, says Viata's Abel.

And because interns may be evaluating the company for possible post-graduate employment, it's important for companies to make students feel welcome.

"I made my decision based almost entirely on the strength of the people and my impression of the environment," says David Leslie, an intern at Boston's MyCounsel.com and a junior computer science and economics major at Boston College.

While working at MyCounsel.com last summer, Leslie helped build the company's online legal help site. He says MyCounsel.com will be on his list of prospective employers when he graduates, but he's keeping his options open. "I found that just posting a resumé with the words 'Web developer' is good for half a dozen calls from placement people a day," he says.

Meserve, a multimedia editor at Network World, participated in Northeastern University's co-op program.



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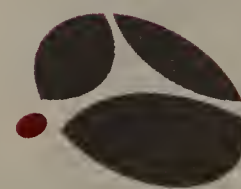
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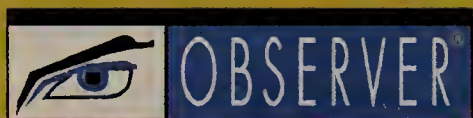
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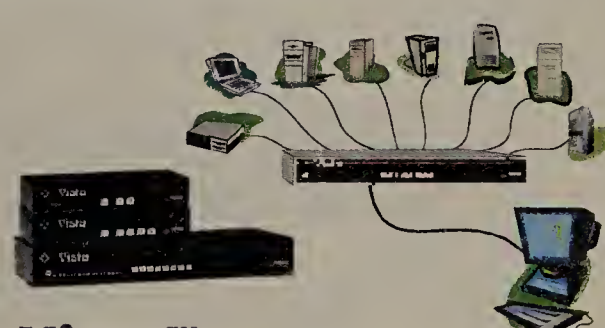
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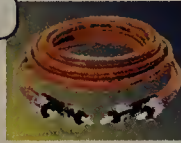
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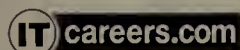
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Send resumes to Technisource Inc., att: Human Resources, 1301 Highway 36, Hazlet, NJ 07730.

SOFTWARE ENGINEER:

Design, develop & implement business & client/server applications using UNIX, JAVA & PERL/CGI. Engineer security & sybase database. Bachelor's in Computer Sci, Systems & Industrial Engineering or related field + 2 yrs exp in position offered. 40 hrs/wk M-F. Fax resume: HYATT LEADER, 212-993-8080, Attn: Paul Sember.

Software Engineer:

Design, develop, test and implement software using Python, SQL, Wise and OOP. Req. BS in Comp. Sci., related/equiv. and 1 yr. exp. Send resume to Mosaic Software, Inc., 800 Fairway Drive, Suite 198, Delray Beach, FL 33441. No Calls.

SENIOR PROGRAMMER/ANALYST (Columbia, SC) to perform system analysis and design, develop, program, integrate and support computer software for agricultural bank loan applications using OOA&D, multi-tiered architecture, data modeling, VB6, SOOL, Stored Procedures, MTS and SOL Server 7 on Windows 98/NT. Require: Baccalaureate degree (or foreign equivalent) in any discipline with at least 18 semester hours or 30 quarter hours (or foreign equivalent) of academic credit in Computer Science, or a closely related field, with 3 years of experience in the position offered or as a Programmer/Analyst. Experience must include 3 years using VB6 and OOA&D. Salary: \$52,000 per year, 8:00 am to 5:00 pm, M-F. Send resume to: Recruiter, AgFirst Farm Credit Bank, P.O. Box 1499, Columbia, SC 29202. Attn: Job CM.

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Software Engineers

At Atlantis Interactive, an Internet and customer service solutions company, we work to take Internet projects from prototype to launch. Striving for excellence in the design and development of highly customized web sites, we change the way business is done over the Internet.

Due to our growth, we are in need of Software Engineers. In this role, you must have significant technical experience with excellent communication skills and an enthusiastic and entrepreneurial personality. Ideal candidates will be well versed in object oriented software engineering, software architecture, Com/D Com, Java, C++ and Oracle Development.

We offer exciting and competitive compensation and benefit packages. Only qualified applicants will be contacted. Interested candidates should forward their resumes to **Human Resources, Attn: Garry Randall, Walker Digital Corporation, Five High Ridge Park, Stamford, CT 06905.** No phone calls please. An Equal Opportunity Employer. M/F/D/V.

Atlantis Interactive

Database Administrators needed by NJ IT Co for Oracle d/base admin & Oracle n/work installation & configuration on Unix & NT platforms. Apply to Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

Sr. S/ware Engineer, Atlanta: Design, develop, test, debug, maintain & document automation of quotation management systs w/interactions to product configurations systs; perform third party integr. w/quotation management systs; use VC++/ATL, Delphi, ASP/IIS, XML, COM/DCOM, Active X, JavaScripts, VB, HTML, SOL, SQL Server, Oracle, Access. Requ's: Masters Degree in Comp. Sci./rel. field+6 mths in job offered or as S/ware Developer. Email resume to lmills@primus.com

Sr. Software Engineer (multiple openings): Design, develop & implement software systems. Two yrs. of exp. in job offered or as a computer professional including two yrs. of demonstrable exp. with: SAP and related software. Work requires travel & relocation. Masters degree or foreign equiv. in one of several ltd. fields: computer sci/appls, math, them., physics, or eng. Salary: \$90,000 per/yr, F/T. Please submit resumes to: Mary Pat Curran, Supervisor, McKeanport/Alleg. Co. Careerlink, 345 Fifth Ave., Pgh, PA 15206. Reference: Job Order No. WEB135992.

USER SUPPORT ANALYST for computer hardware sales company. Degree & experience required. Competitive salary. Resume to: Rainbow Computer Corp., Attn: Eduardo Prepelitchi, 10877 NW 33 Street, Miami, FL 33172 or fax: (305) 592-2903.

Senior Software Engineer needed. Master's plus 2 years software development experience including C++ and Java. Send resumes to: Software Artisans, Inc., 1330 Beacon St., Suite 400, Brookline, MA 02446. Attention: David Wihl

Strata Solutions Inc is seeking software developers for high-end commercial and operations software with experience including several of the following: Oracle, Sybase, Informix, SOL Server C, C++ VB, PB MRP, ERP, CIMPPLICITY Mainframe technologies. Please submit resumes to resumes@stratasolutions.com or fax it to 336-834-8750.

Positions available for experienced SAP Consultant w/ABAP/4. Bach. Deg. req'd. Comp. Sal & Benefits. Send resume to: Dulogic Systems Inc., 11 Lilac Lane, Latham, NY 12110.

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Send your resume to Rod McFadden
Kama Consulting
Fax: 201-934-7166
Email: Kamaco@aol.com

Database Design Analysts needed to analyze, dsgn, dvlp, implmt d/base models for e-commerce projects using Java, JavaScript, HTML, Total e-Business, JSP, Oracle & Saphire/Web. Apply to R. Gorga, Bluestone Consulting, 1000 Briggs Rd, Mt. Laurel, NJ 08054.

Application Analyst at SAP America, Inc. -Under moderate supervision, implement SAP R/3 for business processes automation: analyze client's needs; design, develop & implement SAP R/3 customizations; train staff & end-users; provide customer support & troubleshooting. Position requires Bachelor's or equiv. in Bus. Admin., Finance, Acctng. or in C.S. Will accept 2 yrs. college educ. plus 2 yrs. C.S. training as equiv. to required degree. Must have 2 add'l yrs. exp. in designing bus. processes & SAP R/3 development & implementation. Send resume with reference to Job Code: G0008/INO/180, to lee.salin@sap.com. EEO/M/F/D/V. No phone inquiries.

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Instructional Designer at SAP America, Inc. -Review & assess training programs; design training courses, computer and paper-based materials, evaluation methods & certification programs for SAP R/3 products; train instructors; review curriculum based on SAP R/3 developments. Position requires Master in Educ., Ed. Tech.. or related field, w/2 yrs in training products design & mgmt for business env. Will accept Bachelor's & 5 yrs. exp. in training products design as equiv. to Master's. Send resume with reference to Job Code: G0008/INO/179, to lee.salin@sap.com or to sapamerica@hiresystems.com. EEO/M/F/D/V. No phone inquiries.

Software Engineer-Financial Systems

Design, implement, administer & maintain financial & business software applications which include client/server applications, such as Oracle Financials 11.x & tools including Reports, Forms, PL/SQL, Developer, Discoverer & Application Object Library. Ability to troubleshoot on Oracle Financial issues, system performance & tuning.

Candidates should possess a Master's degree in Computer Sci, Business Admin or related degree + 1 year of exp. In lieu of a Master's w/1 year of exp, we will accept a candidate who possesses a Bachelor's degree in a similar discipline as outlined above + 5 years of progressive exp in the position offered. 40hr/wk Mon-Fri. Pls contact MODO EYEWEAR, 594 Bway, NY, NY 10012, Attn. Morgan White. No phone calls pls.

Senior Consultant needed by Software Development Co. in Edison, NJ. MS/BS in Comp Sci or Engg reqd. Only experienced candidates need apply. Reply to: Tony Mitchell, Transcom Intl, 1163 Inman Avenue, Ste 103, Edison, NJ 08820.

Full-time Senior Software Development Manager. Responsibilities include: Manage the design, development and implementation of automated financial banking systems; manage the development and implementation of mainframe and branch automation, ATM, internet banking, cash management, money market and payment systems; manage the development of data and voice communication networks; utilize knowledge of financial industry and banking industry transactional processing systems in order to assess and evaluate particular client needs and to ensure that projects are completed within time and budgetary constraints; manage the recruitment, hiring, firing and assignment of professionals and support personnel; and manage Software Engineers and other computer professionals. Master's Degree or foreign educational equivalent in Engineering or a related field and 3 years of progressive experience as an IT Manager or a related occupation, or a Bachelor's Degree or foreign educational equivalent in Engineering or a related field and 5 years of progressive experience as an IT Manager or a related occupation. Salary: \$66,800/yr and up, commensurate with experience. Must have proof of legal authority to work in the United States. If interested, submit resume in duplicate to:

Ms. Nancy Tomaselli
Fundtech Corporation
157 Technology Parkway,
Suite 100
Norcross, Georgia 30092

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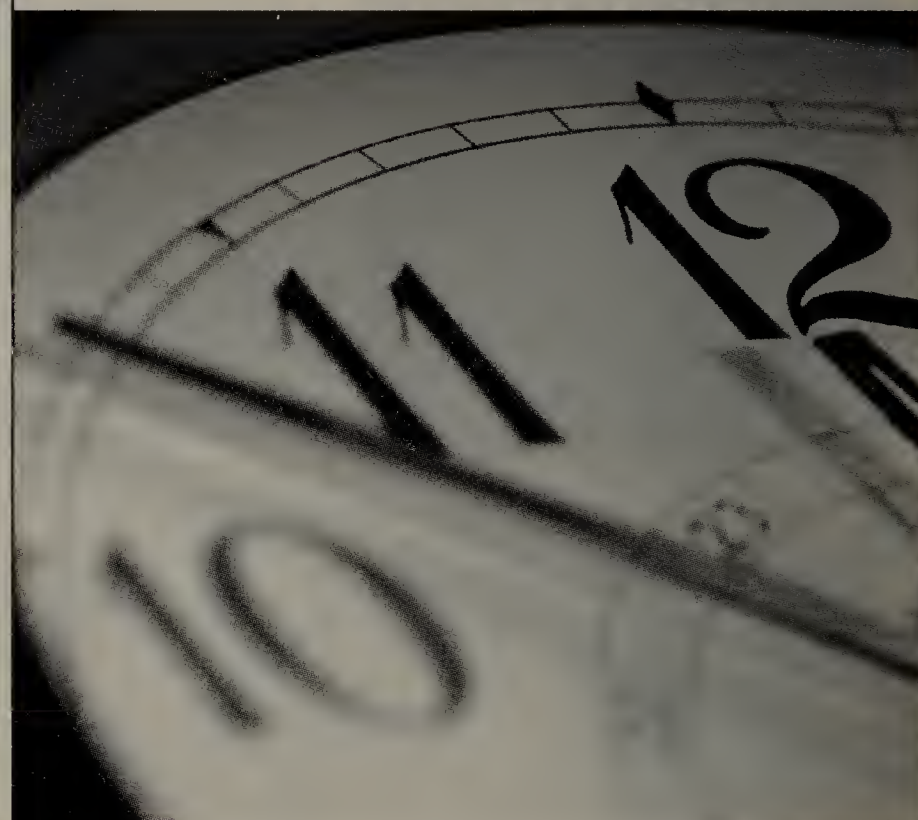
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SENIOR TECHNICAL CONSULTANT-(Champaign, IL) Responsible for independently planning, developing, testing and documenting non-routine complex computer programs incl. Ingres ABF4GL using C on a UNIX platform and TRIS+2 modules. Analyze, design, develop implement & maintain non-routine, complex programs incl. TRIS+2 modules & Ingres ABF4GL. Analyze customer req. and product function capabilities. Responsible for making recommendations based on function & cost benefit analyses & maintaining products which involve debugging & performance improvement. Req'd.: Bach. Deg. in Comp. Sci., Physics or any Math, Electronics or Eng'g discipline and 3 yrs. exp. in the job offered or 3 yrs. exp as an Analyst/Software Developer. Must have exp. in UNIX, C, SQL & Ingres/4GL, billing & Customer Care business applications. 40 hrs/wk. M-F 9am-5pm. \$69,102/yr. Applicants must show proof of legal authority to work in the U.S. **ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY**, 401 South State Street-7 North, Chicago, IL 60605, Att: Shella Lindsey, Ref. #V-IL24048-L. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

SENIOR TECHNICAL CONSULTANT-(Champaign, IL). Responsible for independently planning, developing, testing & documenting non-routine complex computer programs incl. Ingres ABF4GL using C on a UNIX platform & TRIS +2 modules. Analyze, design, develop, implement & maintain non-routine, complex programs incl. TRIS+2 modules & Ingres ABF4GL. Analyze customer requirements & product function capabilities. Responsible for making recommendations based on function & cost benefit analyses & maintain products which involve debugging & performance improvement. Req'd.: Bach. Deg. in Comp. Sci., Physics or any Math, Electronics or Eng'g. discipline and 3 yrs. exp. in the job offered or 3 yrs. exp as a Programmer/Analyst. Must have exp. in UNIX, SQL, C, SQL, C++ & GUI programming & billing, supervisory & telecommunications industry exp. 40 hrs/wk. M-F 9am-5pm. \$60,900/yr. Applicants must show proof of legal authority to work in the U.S. **ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY**, 401 South State Street-7 North, Chicago, IL 60605, Att: Shella Lindsey, Ref. #V-IL24002-L. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

Senior Systems Analyst for West Central Illinois company. Requires B.S. in either Computer Science or Electronics Engineering, +2 years experience as a Systems Engineer. \$70K per year, 8:00 a.m. - 5:00 p.m., 40 hrs/wk. Consult with client companies to determine user requirements. Develop analysis models and logical data models using object-modeling tools such as, Rational Rose. Evaluate user requests for new & modified programs; determine feasibility, time & cost. Formulate plans outlining steps required for program development using object oriented analysis and design techniques using Booch/UML methodology and design patterns. Manage the development of applications using object-oriented languages such as Java and C++ and relational databases Oracle & DB2. Applicants must show proof of legal authority to work in the U.S. Send resumes to: **ILLINOIS DEPT. OF EMPLOYMENT SECURITY**, 401 S State Street - 7 North, Chicago, IL 60605, ATTN: Leonard Boksa. Reference #V-IL 24309-B, An Employer Paid Ad, NO CALLS - Send 2 COPIES OF BOTH RESUME & COVER LETTER

Software Engineer, Databases

Uses Object - Oriented Design and Analysis techniques in conjunction with C/C++ and Visual Basic to modify, test, debug, document, and develop sophisticated financial software based on large data set relational databases for the purposes of insuring data flow and data access within such relational databases. Insures the reliability and viability of such software systems and their integration in a TCP/IP environment which is run on multiple platforms. Uses class library software engineering techniques to modify relational databases for a systems implementation and integration into a financial trading system which will implement and interface within financial trading software in a real time environment to receive real time financial marketing pricing information. Tests, maintains, and organizes database structures to accommodate internal and external information and insures network configuration including LAN, WAN, Windows NT, and internet connections by developing appropriate mathematical algorithms. Requires Master's degree in Computer Science. Education to include completion of one project in the solution of synchronization and concurrent software design process for client/server environments and one course in each of the following: Computer Communication Design; Concurrent Software Design; and, Distributed Computing Principles. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at \$70,000 per year salary. Applicants must show proof of legal authority to work in the U.S. Please send two copies of resume and cover letter to: **Illinois Department of Employment Security**, 401 S. State Street - 7 North, Chicago, IL 60605, Attention: Lydia Clarke, Reference #V-IL23665-E, AN EMPLOYER PAID AD. NO CALLS.

Senior Consultant/Analyst - provides software consulting services in an IBM mainframe environment to diverse clientele; participates in full-life cycle development, including development, implementation and testing of system-wide applications; analyzes user needs; uses packaged software to perform basic database manipulation with a relational database management system (RDBMS); must have documentable ability to program in COBOL II, Java 1.2 and PL/SQL. B.A. or B.S. degree in computer science, engineering or math and 2 years experience. Hours: Mon. - Fri., 8:00 A.M. - 5:00 P.M., St. Louis MO. Salary: \$58-68,000 year, per experience. 5 available positions. Send resume to Ms. J Gaston, Div. of Workforce Dev., 4040 Seven Hills DR, STE 166, Florissant MO 63033. Refer to job order #245676/247736.

Software Consulting: Various places in US. SW Engr, Prog/Analyst, DB Devp & Admin, Tech Supp, Syst & Ntwrk Admin, MIS, Tech Recrtr, etc. Req MS/BS + exp. ExInt pay & benes. Send copy of this ad + your resume to Dir. Recrmnt, CompuWizards, 1301 Ygnacio Valley Rd., Walnut Creek, CA 94598 or visit us at www.compuwizardsusa.com

Two full time Consultants needed for a large mobile communications network company. Must have a Bachelor's degree in Electronics and Communication Engineering or Electrical Engineering or foreign degree equivalent accepted and two years of experience. Salary: \$69,180/yr. Send resume to: Chip Anderson at Logica Radio Planning, Inc. 3535 Travis Street, Suite 100, Dallas, Texas 75204.

Software Jobs (Consultants): Various places in US. SW Engr., Prog/Analyst, DBA, User Supp, Supv etc. Pay DOE. Send copy of this ad + your resume w/salary reqs, job interests to: Geosoft Infotek, CA 94015 or email: geolog@mindspring.com.

PROGRAMMER/ANALYST Design, code, test, debug, implement, maintain & document programs using various programming languages & operating systems. perform routine system analysis, logic diagramming & test data creation. perform technical analysis & make recommendation concerning utilization of system and business resources. B.S. in Electrical Engineering (or closely related field) & 1 yr. exp. as Programmer/Analyst or Computer Eng. 8:00 a.m. - 5:00 p.m. \$50,000.00/yr. Fax resume to (248) 559-6308 - Attn: HR Mgr.

Investment Analyst Software Industry Equities

Capital Research Company, Los Angeles, is seeking an Investment Analyst with at least a Bachelors degree (finance, economics, or business) and 5 years of prior experience as an investment researcher or management consultant. Area of coverage: software industry equity analysis. Involves monitoring of global software industry technologies; corporate asset valuations; on-site fact-finding; development of industry models and forecasts; buy-sell recommendations. Resumes to: Management Recruiting, 333 S. Hope St., Los Angeles, CA 90071 or www.capgroup.com/employment

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COMPUTERS

Software Sales Consultant. Assume lead role in the preparation and presentation of technical sales demonstration, seminars and meetings to sell RDBMS software development tools in client/server computing environments. Provide a source of state-of-the-art expertise in systems architecture and explain technical specifications and capabilities of software products. Participate in analysis and design of system prototypes. Must have BS in Computer Science, info Systems, Ops. Research, Comp. Eng. Or academic equivalent +2 years' software consulting, development or training experience. Location: Boston area. \$65,000/yr. 8 am to 5 pm. Send 2 copies of resume to Case # 19992953, Labor Exchange Office, 19 Staniford St., 1st fl., Boston, MA 02114.

Software Engineers (multiple positions) sought by Dallas, Texas-based Comp S/ware Consultancy Firm. Must have Bach or equiv in Comp Sci or Engg & 1 yr s/ware exp. Respond to: HR Dept., Innovative Business Solutions, Inc., 5353 Alpha Road, Suite 108, Dallas, TX 75240.

MD Product Architect-(Champaign, IL) Determine the direction of the Mediation Device product. Resp. for on-time delivery of the product to the rest of the company & customers. Train MD support staff on the product. Work w/Development Mgr. To develop project plans for each new release or patch of product. Help gather req. from customers & internal staff. Create functional designs and assist with detailed design, coding, testing, documenting & implementation of product. Participate in development meetings & customer gatherings where necessary for gathering of req. and dist. Of information. Work involves UNIX, C, C++, shell scripting, Object-Oriented Analysis & Design, Unified Modeling Language, File Transfer Access & Management, Graphical User Interface using Microsoft Foundation Class. Use object design methodologies & preparation of documentation. Req'd.: Mast. Deg. or equiv. In Comp. Sci., Physics or any Math, Electronics or Eng'g discipline and 2 yrs. exp. in the job offered or 2 yrs. exp as a Software Engineer. Must have exp. w/Object Oriented Analysis & Design, United Modeling Language, C++ programming on UNIX and shell scripting, Windows NT, C, SQL., advanced exp. w/networking & communication methods (TCP/IP & asynchronous communication programming); file transfer access & mgmt protocols & call collection process, ability to write clear documentation and Clearcase or RCS. 40 hrs/wk. M-F 9am-5pm. \$70,269/yr. Applicants must show proof of legal authority to work in the U.S. **ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY**, 401 South State Street-7 North Chicago, IL 60605, Att: Shella Lindsey, Ref. #V-IL24252-L. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

SENIOR TECHNICAL CONSULTANT-(Champaign, IL) Participate in all higher level complex specifications & development as it pertains to the analysis, design & development. Meet w/management to determine system req. and assist in refinement of req. leading to the development of technically feasible specifications. Participate in the development, testing (unit & system) & documentation of the req'd software. Participate in development of work plan to conduct planning assignments; meet w/senior client mgmt. To develop business model; meet w/client personnel to define info req. of detailed activities contained in the business model; determine commonality of info req. by defined application systems and develop data architecture showing how & where data will be maintained & shared, incl. Organization of the utilization of the database as well as determining how the software will access the database. Assist EDP development staff and users to ensure that the applications are in conformity with the optimal use of the existing system's architecture. Req'd.: Bach. Deg. in Comp. Sci., physics or any Math, Electronics or Eng'g discipline and 3 yrs. exp. in the job offered or 3 yrs. exp as an Analyst/Software Developer. Must have exp. in UNIX, SQL, C, C++ & GUI Programming, & have billing, supervisory & telecommunications industry. 40 hrs/wk. M-F 9am-5pm. \$66,706/yr. Applicants must show proof of legal authority to work in the U.S. **ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY**, 401 South State Street-7 North, Chicago, IL 60605, Att: Shella Lindsey, Ref. #V-IL24049-L. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

Manager-Web Development-ABC-Naco, Inc., Downers Grove, IL - Direct implementation of enterprise resource planning software; develop, implement and support new Information Technology solutions; assist in migrating existing software and hardware systems; and implement and maintain E-R-P software package. Administration of Microsoft NT4, 11S4, SQL 7 and Backup tools. Apply marketing concepts and strategies to web-based communications tools. Requires a B.S. in Business Administration/Computer Science/Information Technology or equivalent required. Fax resume to Jon Vigano at 630-737-0167. No calls please.

PROGRAMMER ANALYST/POWERBUILDER DEVELOPERS

Resp. for developing, testing, implementing & supporting business software applications; employing a warehousing program utilizing Power Builder 6.5, Sybase 11.9 & Windows 95 to develop specialized database systems; developing future changes & upgrades following full systems testing. Requires Bachelor's degree or foreign equiv. in Computer Science or Engineering plus at least 3 yrs exp. in software development or Master's degree in Computer Science. Must also be proficient in Power Builder 6.5, Sybase 11.9 & Windows 95. Send resume w/cov ltr to Bill Bennett, Otterbase Technical Services, 77 Monroe Center, NW, Suite 605, Grand Rapids, MI 49503.

Senior Information Systems Support Technician I/II



Salary: \$4,521 - \$5,390/mo. + 7% PERS

The City of San Mateo's Department of Information Technology supports over 450 desktops and 150 laptops at 18 facilities networked together over leased lines and an Ethernet WAN. We are seeking a talented, self-motivated team player to fill the following position: Senior Information System Support Technician I/II.

The position helps maintain and support the City's local and wide area networks as well as provide second level PC support. Candidates must be able to perform a wide variety of complex technical duties involved in installation, repair and maintenance of personal computers, peripherals and network equipment under the direction of the Network Administrator.

Requirements include degree from two-year college/university in computer science or related field and one year of experience comparable to System Technician II position in City of San Mateo along with NT workstation experience.

For application, call the **Job Hotline** (650) 522-7777 x 424, or visit our website at www.ci.sanmateo.ca.us
Position open until filled. EOE

IT INITIATIVE LEADER

Battelle, a leader in the development and commercialization of technology, is seeking experienced IT professionals to lead efforts to create commercially-viable information technology and to support the launch of business ventures based on that technology. These positions are located in both **Columbus, OH and Richland, WA.**

In this role you will develop, lead, and actively participate in R&D initiatives. Ensure the development of Intellectual Property (IP) that has applications across multiple initiatives, products, and markets. Lead the development of commercially-viable IP and participate in the launch of IP-based commercial ventures.

If you have expertise in one or more of these areas: Information Analysis; Information Mining, Integration, & Visualization; Health, Medical, Bio, or Chem Informatics; eCommerce Applications; or Network or Information Security; a minimum of 10 years' program management experience; and experience creating, identifying, capturing, and protecting commercially-viable IP, we'd like to hear from you.

Are you seeking this kind of challenge and opportunity? Please submit your resume to Battelle at www.battelle.org/jobs, **job reference no. 100984**. Battelle is an Equal Opportunity/Affirmative Action Employer M/F/D/V.

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If you want to work with a company that's defining the future of Web-based business, your time has come. We're **Day Corporation**, the first and only organization to develop a single solution – **Communiqé™ 2** – that has the sophistication, flexibility and elegance to address every aspect of a business' Internet needs. As part of Day, you'll be exploring and challenging your ideas with a team of experts who are focused on the same objective: to continue developing technology that's *a breed of its own*. Sound like the opportunity you've been waiting for? Come to **Day**.

PROJECT MANAGERS

We're seeking hands-on leaders to oversee Web development projects for our LA office. In addition to heading a team of Software Engineers, you will determine and address client needs, create and initiate project work plans/schedules as well as prepare and deliver client presentations. This role calls for a self-motivated individual who can balance multiple projects and priorities while adhering to strict budgetary and time guidelines. Requires strong client service skills and a familiarity with current Internet technologies. Ideal candidates will have a background in Internet project management, systems integration, technology consulting, sales and/or marketing.

SOFTWARE ENGINEERS

You'll be developing, testing and refining our first-of-breed technologies. To qualify, you must be a versatile self-starter experienced in client- and server-side scripting with one or more of the following: Java Script, HTML, C++ and/or DHTML. Requires a BS/BA (or equivalent background) in CS or a related field and experience with Web projects, ideally in corporate IT environments. A working knowledge of a ODBC compliant database technology (Oracle, Informix, MS SQL Server, etc.) is also a skill set we are seeking, as is a familiarity with current Web technologies (XML, SSL, Web servers, LDAP, etc.). Ideally, you will be skilled in NT or UNIX, consulting and project management.

Both positions involve local, national and, potentially international travel. Our compensation package features all the standard benefits plus stock options, 401(k) and unparalleled opportunities for career advancement. For consideration, send resume to: **Day Corporation, Attn: J. Coghill, 5514 Wilshire Blvd. Floor 7, Los Angeles, CA 90036. FAX (323) 938-9884. Email: us.jobs@daynetwork.com. EOE.**



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COMPUTER

At Lucent Technologies, we're defining the future of telecommunications. We're looking for individuals with a BS or MS and 1-2 years of directly related experience as:

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- Process Engineer
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- Product Market Engineer
- Product Validation Engineer
- Product Wireless Dev Engineer
- Programmer
- Programmer Analyst
- RF Engineer
- Software Architect
- Software Developer
- Software Engineer
- Software Tester
- System Administrator & Integrator
- Systems Administrator

We seek expertise in the following:

- C/C++/UNIX
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- Fiber Optics
- GUI Design
- Internet/Network Protocols/WinNT
- OO Methodologies/SmallTalk
- Oracle Dev/Applications
- Quality
- RDBMS
- SAP
- Software Tools
- Switching technology
- TCP/IP
- VB
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Hot Companies: How The

If there's one thing that can muddle customer satisfaction and business success, it's the workforce. In this tight labor market, companies are paying increasing attention to how they identify top talent, bring these people on board and then keep them. The cost of replacing any one person is critical – in terms of time, performance and cash.

The best equation, companies have found, is that keeping employees is the best way to attract employees. They talk about the opportunity to work with other bright, passionate people, about finding ways for the company to appeal to unique tastes and needs, and they acknowledge that the challenge of the work is more important than the pay when it comes to keeping good people.

The data says IT companies and organizations are posting employee turnover in the double-digits. The companies featured here are looking at turnover rates below 10 percent – and they continue to work to drive them down still further.

CABOT CORPORATION, BOSTON, MA

Among the top IT employers in the country, with a 95 percent retention rate, is a company known most for what it brings its customers in specialty chemicals, energy and materials. Cabot Corporation, with 39 operating plants in 23 different countries, has 125 IT employees.

Among the reasons for the low turnover? Cabot uses a selection process that relies on relationships. "We tend to hire people who have worked with us in some type of consulting basis," explains Craig Bickel, vice president and CIO. "We do a lot of work to assure that people fit with our culture and bring the experience we need. We're not looking for people for a project. We're looking for people who will build a career here."

Bickel says the company is able to attract top-flight talent for several reasons. "We have the standard things like signing bonuses and relocation packages," he explains. "We also have short-term stock options and long-term restricted options. High performance people tend to reach the short-term award fairly quickly."

However, he claims that compensation is just one point. "What employees tell me is that they like the flexible and empowered work environment. We have a fairly active IT environment – right now we're going through a global renewal of all our core business applications based on re-engineering of the businesses and standardized processes," Bickel says. "We will be one of the very few companies who will use a global model of ERP, using all languages. We'll use this as a foundation for our e-business strategy."

Bickel counts off several other reasons employees stay with Cabot. "There's a strong link between business and technology, partnered with business leadership," he

says. "Our infrastructure people in the operational parts of the business share in the analysis and decision-making regarding the selection of technology instead of relying on a separate new technology group. We work globally, giving everyone a chance for assignments in other countries and working with other cultures. Our jobs are fairly broad, combining and developing project management, analysis and implementation skills. This means people can gain management skills while maintaining currency in technical skills. We also are a flexible company, encouraging employees to make life choices that combine balance with work needs."

Currently Cabot is looking for IT experts to assist in connecting internal e-business operations with portal technology; e-business analysts to develop commercial applications, people with database management and content delivery skills; and people with understanding of work flow and application integration.

EQUIFAX INC., ATLANTA, GA

If anyone can tell the Equifax story for potential employees, it's current employees. According to Katherine Crew, vice president of human resources for Equifax's technology group, "Our employees are highlighted at hot internet job and interest sites, giving their own view of Equifax as an employer. It's a credible source for others to learn about the kind of company we are, and what it's like to work here," she says.

What they learn is that Equifax has data at the core of its business competencies, providing consumer verification data and secure transactions for e-commerce. "If you're making a transaction through eBay, you're most likely using Equifax technology," explains April Lothon, vice president of global technology.

It doesn't hurt that Equifax is an IT business. "Information and technology are what we do for a living, around the world," Lothon says. Virgil Gardoya, chief technology officer, sits on the CEO's staff, helping develop and drive the company's strategy and business. Recently the company was awarded a project in Australia introducing financial record services that accommodates the requirements necessary for record service centers in both Australia and the United Kingdom. "That was a big coup for us," Lothon says. "It points to the fact that IT is the backbone of our business at Equifax."

While the business and projects attract employees, Crew believes the environment – what employees exploit – helps keep them. "We've worked hard to create an environment that allows technology employees to do work that is challenging, that provides learning opportunities and where they have the flexibility needed to get the job done. We're constantly watching to make sure we provide the challenge and the environment." Equifax employees are eligible for 401(k) matching programs on their first day of employment, and the company recently added 18 more funds to what's available for employee investment.

Just as important as listening to employees is responding. Lothon said in November the company opened an employee fitness center for use by Atlanta-based technology associates as a direct response to employee input. "We also focus on treating one another with respect and working together for our community." Lothon believes the environment and the work is exciting. "We're directly touching how e-commerce is developing around the globe," she says. "Everyone here



y're Boosting Retention

interacts with team members in other countries, working as virtual teams. You learn about different cultures, what's going on technologically around the world."

Equifax is focused on measuring employee satisfaction. "We continue to work on improving technology employee retention through employee action teams, surveys and constant monitoring," says Crew. "Right now we're looking for people with skills in project management, database administration, UNIX system administration, quality assurance and testing, and programming. We look at the potential for each person, not just where they are today."

MEDIA SERV, INC., MANHATTAN, NY

Ask anyone where company loyalty is strongest, and they'll tell you it rests in the hands of small companies that morph quickly to take on new challenges and accept new technologies and people. That's the situation at MedioServ, where a 60-member team serves clients including Bloomberg, The Guardian Life Insurance Company of America, William M. Mercer, Real Media and Viacom. "We are always in a hiring mode," says Koren Kugol, recruitment manager. "We hire potential and then allow people to create great results."

"Ultimately, what really keeps people here and attracts them to want to work here is that we work on really great projects," Kugol adds. "We seek those who have a love and a passion for technology, but who also have a full life."

The projects are varied. MedioServ has developed automated online broker portals, wireless automated stock trading processes at the NYSE, custom CRM applications, web-based financial systems for generating and analyzing investment portfolio scenarios, customized online auction systems, and customized digital dashboards. With a retention rate resting around 97 percent, MedioServ's approach is obviously working.

There are no large-scale processes to bring people on board. Instead, Kugol focuses on hiring people who can add value — people who bring something to MedioServ and who allow others to learn and to better serve consulting clients. "For instance, we had a new employee come in and offer up an entirely new way of extracting customer requirements that helped the entire team huddle and become involved with all aspects of the client's needs quickly. By encouraging everyone to bring their creativity and aptitude, we've been able to create a positive environment."

While there are typical compensation benefits — including semi-annual bonus awards — the company takes a personal approach to recognition, too. Each year MedioServ hosts a company 'Holiday Weekend' at a ski lodge for employees, their significant others and children. Back at the office, home-cooked breakfasts are served monthly, "and you have the latest toys and tools to do your job," says Kugol.

The one thing "we can promise is that every day is different," she adds. "We ask you to use your passion to build extraordinary solutions for our customers, and we can guarantee you'll be working with some of the brightest people in the business."

THE MONY GROUP, NEW YORK, NY

The MONY Group competes in the dynamic financial services market among the aggressive financial services firms that are using technology to create new opportunities with customers for real-time service and response. As with other companies boasting of high retention and low turnover, MONY leaders point first to the environment as what attracts and keeps top talent.

"What we've found out is that we have created a unique environment here," explains Melanie Johnson, manager of IT human resources. "It's a challenging and rewarding environment, but it's also supportive." Johnson adds that being a company that is well thought of in a competitive market sector doesn't hurt. "We're growing and expanding our core financial services offerings," she says.

The support begins with a two-week boot camp that helps new IT employees understand the MONY strategy, customers and processes. A mentor is assigned

to the new IT employee, working with the individual to gain experience quickly and to maintain a careful watch to assure that the employee continues to grow and learn. The IT organization's place in MONY's growth and development has become more and more critical, whether in enabling it to become a publicly traded company or in developing e-business capabilities that help customers. "E-business is one of our biggest focus areas for the coming year, how it applies to financial professionals, customers and employees," adds Johnson.

While MONY has increased its direct contact with potential employees through the Internet and job fairs, its biggest employment blitz has been based on employee referrals. Fully 30 percent of all MONY IT employees hired in the past year have been a result of employee referrals. "People tend to refer people who are terrific," says Johnson. "Employees understand how we work and can quickly identify those who will add value to MONY."

To assure that MONY would meet the needs of employees — not just the majority — the company did a demographic study, looking at various age groupings, living situations and work situations. "We found that the employees in their 20s really want the technical challenge, and they have the hot skills needed to meet the challenge. We put them right into the hottest projects we have. There are other employees who have been here longer, who have the knowledge and leadership needed to keep things moving around obstacles."

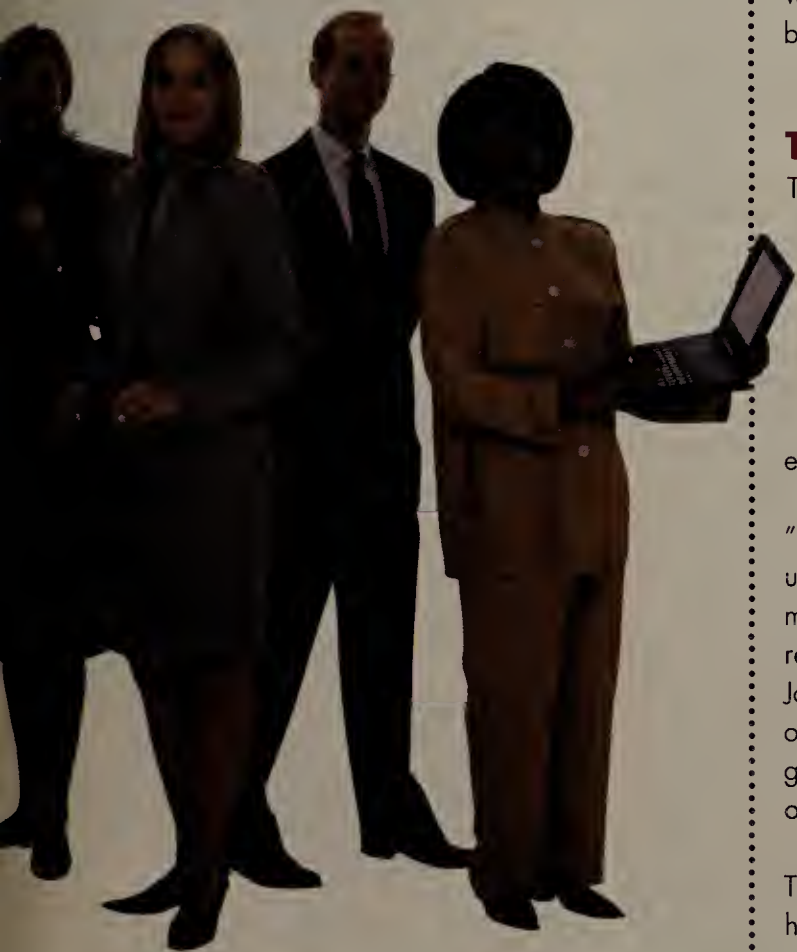
Using this approach, MONY has a retention rate of 92 percent. The same study helped Johnson identify personal needs for employees — from dealing with aging parents to having no or little time for personal fitness. "We have given our (high performance work team) coaches the flexibility and free reign to do what is needed for employees, whether it's in terms of benefits, working tools or assignments."

MONY currently has about 350 people in its IT organization and is seeking newcomers primarily in application development. "We're trying to build an organization that is world class in system integration," reports Johnson. "It's critical that we attract people with business knowledge and analytical skills and who can help us identify, buy, customize and integrate applications. It's what will provide MONY with the speed it needs to continue to grow."

IT careers

For more job opportunities with IT firms, turn to the pages of ITcareers.

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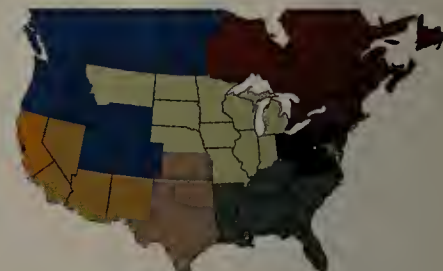
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CLEC,
continued from page 1

said it has enough cash "to fund operations into the second quarter of 2001."

• DSL carrier Covad Communications' CEO resigned, and the company's stock price plummeted in the wake of disappointing financial results.

Such problems should "raise a yellow or red flag" for customers, says Brent Bracelin, an analyst with Pacific Crest Securities. "[Some of] these folks might not be around much longer."

So what's causing the shakeout?

"The biggest problem is that there are just too many players in the telecom field right now," says Jeff Moore, a senior analyst with Current Analysis. There are only so many total telecom dollars to go around, and too many providers trying to grab them, he explains.

According to research from New Paradigm Resources Group, a telecommunications market analysis firm, there are currently 217 CLECs with some of their own facilities in place or plans to build facilities.

Roger Philipps, IT/telecommunications manager with Southwestern Battery Supply in Garland, Texas, says CLECs are akin to other New Economy companies that relied on bundles of stock market money to fuel their growth.

"These guys were expecting the world to beat a path to their doors, but everyone is taking a harder look at the viability of these Internet businesses, and frankly, that is what these CLECs are," he says.

Philipps says he is leery about using CLECs, believing that service reliability is more important than saving a few dollars. "I don't want to have to worry if my provider will be around in six months," he says.

Another network manager, who asked not to be named, says the CLEC woes would definitely make him think twice about going with a lesser-known service provider.

"Customer support — being able to talk to a live person 24-7 when we have problems — is critical in picking a carrier, and I'd expect that's where they'd cut jobs when in the red," he says.

Industry watchers are quick to note that not all CLECs are

alike. For example, they see promise in a new breed of carrier such as Yipes Communications and Cogent Communications that offer flexible per-megabit pricing which beats rigid T-1 and T-3 line equivalents. Still, even some CLECs that analysts cite as those that are doing well — such as Allegiance Telecom, McLeod USA and WinStar — are losing money.

It's not getting any easier for CLECs to get new money to expand their networks, says Rosemary Cochran, an analyst with Vertical Systems Group.

"They need a lot of capital to build out," she explains. "Unless you build, out you can't get customers."

Pacific Crest's Bracelin

CLEC customer tip sheet

Find out whether the CLEC:

- ☐ Owns its own infrastructure.
- ☐ Offers a full range of data and/or voice services.
- ☐ Has a solid record of meeting analysts' financial expectations.
- ☐ Shows strong revenue growth.
- ☐ Offers services for all areas your company operates in.
- ☐ Has a significant customer base.
- ☐ Has plans to expand its service area and range of services offered.

echoes Cochran's thoughts. Wall Street is looking less favorably on CLECs because they are not making enough money soon enough to make good on the huge sums that have been invested in them, he says.

"Access to capital for that whole group has been significantly reduced over the past nine months," Bracelin says. "The attitude on Wall Street is you have to earn the right to raise another \$1 billion."

One major factor that can determine if a CLEC will succeed is whether it owns its infrastructure, Current Analysis' Moore says.

"It's hard to be profitable when you're running on another firm's network," he says.

Although there are carriers that started out as CLECs and had their own fiber into buildings, they eventually built long-distance networks or were bought by and incorporated into WorldCom, AT&T or others.

Other characteristics Moore says corporations should look for when considering a CLEC are a wide range of services and a broad geographic reach.

Companies should look at the CLEC's balance sheet and customer base, and should press carriers on what new services are in the offing and how soon they will roll out, Vertical Systems' Cochran says.

"The selection process has become more problematic," she says. "The [customers'] financial people may have to become involved in some of these decisions."

Customers that haven't gone the CLEC route say they aren't surprised some CLECs are failing.

"The CLECs seem like they came up over night, and if they come up that fast it seems they go away that fast," says Bill Lasseigne, program manager for Collin County (Texas) Community College. "How do they compete with the big boys when they are on the same lines? It seems that to be competitive they have to have their own lines."

Lasseigne's network encompasses four campuses, which are served by incumbent local exchange carriers.

"From what we understand, if we use the CLEC, we'll be using the same lines as we do with [the Bells]," he says. "There is not much to gain — actually we see a loss, especially when we need [customer] service, since we'd have to report [any problems] to the CLEC first."

Dave Wither, corporate telecommunications manager for Marconi Medical Systems in Cleveland, manages an approximately 70-site nationwide network that serves 5,000 employees. He has looked at CLEC proposals and considered using CLECs for alternate access at some remote sites.

"The problem is they don't understand alternate access," he says. "They're basically buying wholesale and trying to sell retail."

Wither says CLECs don't offer enough of a cost savings to offset the risk a company runs by going with a largely unproven provider. ■

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Vendors jostling over XML security specs

BY ELLEN MESSMER

It's a bit like the presidential election, but only within the software industry: Two camps are promoting their own security specification for XML as a winner, while the public really just wants one that works when it's put to a real-world test.

On one side, Netegrity last week joined with Sun, WebMethods, VeriSign, Art Technology Group, Commerce One and others to back a specification they call the Security Services

■ **"We're a strong proponent of open standards, and we'd like to see a single spec."**

Chris Haddad, engineer, Employease

Markup Language (S2ML). The specification, which is expected to be unveiled next month, is XML-based technology that's supposed to be used in software applications to capture and share authentication and authorization information. Its envisioned use is in complex supply-chain environments and trading exchanges to simplify user authorization.

However, a second camp led by Securant is pushing a similar specification called AuthXML. Its supporters include Check Point Software Technologies, SilverStream and others. Entrust, iPlanet, Oracle, IBM and others are evaluating the specification, according to Securant.

Like some Florida voters who apparently punched more than one hole in their ballot, a few of the S2ML backers are also AuthXML enthusiasts, including WebMethods and VeriSign.

Companies interested in an XML-based security specification say they hope the two camps somehow manage to

combine these nascent efforts into one winning technology that would provide the equivalent of single sign-on for e-commerce purchasing.

"We're a strong proponent of open standards, and we'd like to see a single spec," says Chris Haddad, an engineer at Employease, an Atlanta company that provides a hosted application used by more than 1,000 companies to purchase business services.

"We don't want to see this XML single sign-on go the way of PKI," he adds, referring to the fact that public-key infrastructure vendors failed to achieve interoperability in their digital-signature products after squabbling over technology.

Securant's principle technological evangelist Darren Platt contends that both XML security camps "identified the need at the same time. ... It was a bit of a surprise" to hear about the Netegrity-led effort last week because Securant met last month in San Jose with a dozen software vendors, including Netegrity, to discuss its XML security specification, he said.

Whether the two camps can get together remains up in the air, but like Netegrity with S2ML, Securant plans to make its technology publicly available. "Our goal is a single industry standard," Platt says.

Backers of S2ML say they expect to submit their technology as a proposed standard to the World Wide Web Consortium and the organization called Oasis, which works on XML technical and business issues. ■

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IN THE RING

Before you pick your favorite secure XML spec, check out online resources about S2ML and its competitors.



find it

Venture Capital,
continued from page 1

Despite the downturn, third-quarter investments remained slightly higher than in the first quarter and more than double the amount spent in the third quarter of 1999. Altogether, 870 network hardware, software and services start-ups received an average of \$15 million each during July, August and September.

Much of the decline was related to dot-coms, with investments in Internet content, e-commerce sites and related services plunging \$2.2 billion — or 30% — from the previous quarter. Among the start-ups that had trouble attracting funds were business-to-consumer e-commerce sites, business-to-business e-commerce sites and consulting firms offering Web site design.

However, venture firms remain optimistic about network equipment, with investments in this segment more than doubling to \$2.48 billion. Indeed, half of the third quarter's 10 largest deals were for fiber-optic equipment, while the other half were for Internet

collocation facilities and service providers.

Fiber optics "is hotter than a pistol," says Kirk Walden, national director of PricewaterhouseCoopers' MoneyTree survey. "When you're talking about laying fiber-optic cable or building a piece of optical equipment, you're talking about notably more money than you need for software or services."

Interest in a safe bet

Bill Collatos, co-founder and managing general partner with Spectrum Equity Investors, says venture firms are interested in Internet infrastructure start-ups such as fiber-optic and wireless companies because they seem like a safer bet than content or e-commerce providers.

"If you think of this entire space as a network . . . what you find is a lot of traffic always runs over the core, regardless of whether some small tributary of the network is slowing down," Collatos says. "There's more reliability in the infrastructure opportunities, in the hardware and software that actually manage the network."

With hot areas

such as fiber optics picking up the slack for weak areas like

e-commerce, Walden predicts that year-end figures will show network investments in 2000 being twice the amount made in 1999.

"We are sticking to our guns on the prediction that we made earlier this year . . . that overall venture capital investments are going to double to \$70 billion in 2000, compared with \$35 billion in 1999," Walden says, adding that the same trend will hold true for the network segment of the economy, which should reach \$46 billion by year-end.

"We are slowing, methodically plateauing to a sustainable level of venture-capital investment," Walden says. "But the bottom is not dropping out of this market."

However, the key statistics were down this quarter for network investments:

- The number of deals dropped 9% from 960 in the second quarter to 870.
- The average size of these deals declined 4% from \$15.65 million to \$15 million.
- The largest deal of the quarter — a \$207.5 million investment in Internet data center operator Relera — is about half the size of last quarter's \$402 million investment in Carolina Broadband.

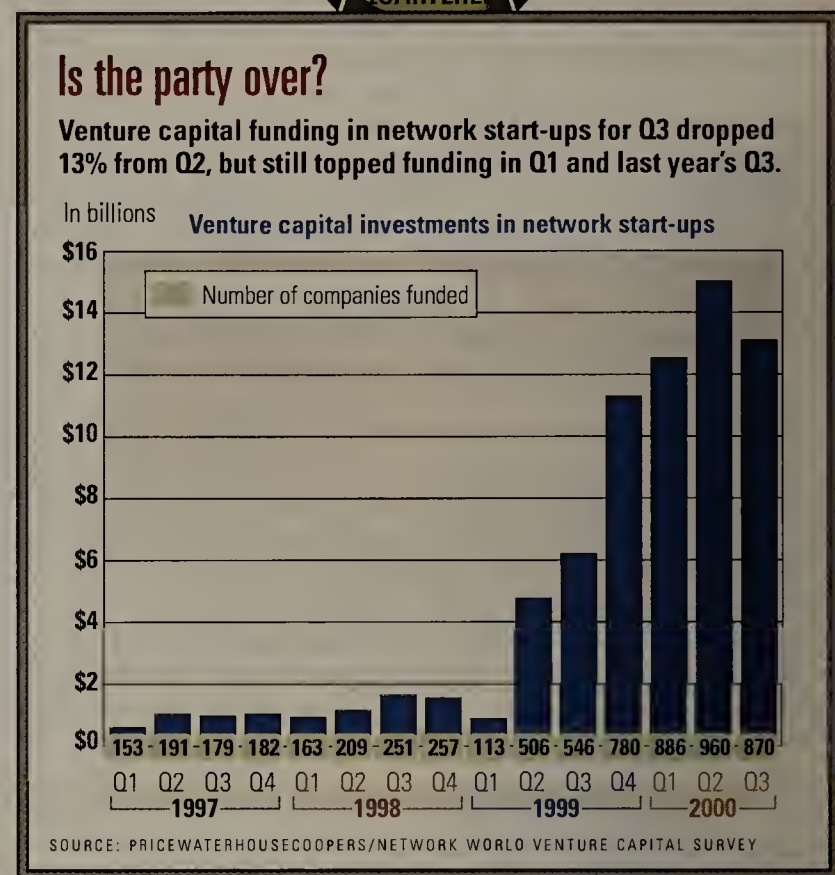
The 10 largest deals of the third quarter ranged from Relera's big prize to a \$100 million investment in Chiaro Networks, a Richardson, Texas, start-up that's developing an optical router for Internet backbone carriers.

Fiber optic push

Investments in fiber-optic start-ups are expected to remain strong for the next few quarters because of several recent billion-dollar acquisitions by Nortel Networks and Cisco of companies building fiber-optic products.

"There used to be only a handful of players in fiber optics," says Tracy Lefteroff, managing partner of PricewaterhouseCoopers' Venture Capital Practice. "With the Internet deals slowing down, everyone wants in."

Lefteroff predicts the market for fiber-optic equipment will remain strong even though the stock values of most telecommunica-



tions carriers are down this fall, and big players such as AT&T and British Telecommunications are splitting up.

"The fiber-optics market is fundamentally more solid than many Internet investments," Lefteroff, says. "[Telephone companies] around the world are all going to modernize their systems [with] fiber optics because of the capacity advantage they can get."

That's what the folks at Chiaro Networks are banking on. Chiaro raised \$100 million last quarter from 13 investment firms led by Polaris Venture Capital and Koor Corporate Venture Capital.

Chiaro is using this windfall to build a large Internet router that has an optical switch fabric and provides a large number of ports and fast speeds for backbone transmission systems. Chiaro plans to have beta-test systems available for customer trials next fall.

"The carriers and the market in general are still going to invest in infrastructure," says Ken Lewis, CEO of Chiaro. "The amount of Internet traffic is at least doubling every year . . . and that's a disruptive thing for carriers. If they don't keep up, they will lose to somebody else that has the capacity."

Lewis says Chiaro's router will let carriers provide a more reliable Internet infrastructure to corporate customers. He predicts the carrier market will remain strong for the next two years.

"One of the things that we're hearing from our customers is that the largest increases in capital expenditures will be for core routing and switching," Lewis says. "There's room for several core players."

Aerie Networks is focused on the same trend. A Denver wholesaler of fiber-optic bandwidth, Aerie raised \$115 million last quarter from a group of investors that includes Vantage Point Venture Partners and Wolf Venture Fund. Aerie also raised debt financing to pay for its network rollout.

Aerie is using the money to build a 15,000-mile nationwide backbone network, with construction scheduled to start in December. Aerie will sell so-called dark fiber to backbone carriers as well as offer outsourced network operations services to corporations.

"The reasons we've attracted so much money are pretty simple," says Peter Geddis, CEO of Aerie Networks. "We have a very clear and focused business plan and a strategy that yields operating cash flow and profit in a relatively short period of time."

Geddis says Aerie benefits from earlier venture capital investments in last-mile technologies such as DSL and cable modems that are bringing broadband capabilities to the home and remote office.

"The backbone systems are not adequate and don't offer See **Venture Capital**, page 88

Q3 top 10 investments

Each of the top deals hit \$100 million or more.

Company	Location	Investment	Business description
Relera	Denver	\$207.5M	Internet data centers
Network Telephone	Pensacola, Fla.	\$156M	Voice/data/Internet provider in Southeast
Intira	Pleasanton, Calif.	\$140M	Collocation data centers
Yipes Communications	San Francisco	\$139.1M	Optical service provider
Aerie Networks	Denver	\$115M	Fiber-optic telecommunications network
Tellme Networks	Mountain View, Calif.	\$113.3M	Provider of Web information over the phone
NovaLux	Sunnyvale, Calif.	\$109.1M	Photonic lasers for fiber-optic equipment
Switch and Data Facilities	Tampa, Fla.	\$108M	Collocation service provider
Pluris	Cupertino, Calif.	\$104.8M	Internet backbone routers
Chiaro Networks	Richardson, Texas	\$100M	Data switches for optical backbone networks

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ICANN picks seven new top-level 'Net domains

Names under the new domains are expected to be available for purchase by spring.

BY CAROLYN DUFFY
MARSAN

The Internet Corporation for Assigned Names and Numbers last week selected seven new top-level domains for the Internet, in a long-anticipated bid to provide competition for the popular .com domain and to make specialized domain names available to corpora-

tions and individuals.

The new top-level domains are .biz, .info, .name, .pro, .aero, .museum and .coop.

ICANN's staff will now begin contract negotiations with the organizations that proposed the new top-level domains. If the negotiations go as planned, names under the new top-level domains will be available for purchase next

spring. Corporations want ICANN to ensure that trademark owners will have the opportunity to buy their company and brand names in the new top-level domains before the names are made widely available under a so-called sunrise policy.

"This is only an initial sampling of [top-level domains]... The ones that we selected represent a good mix," said Esther Dyson, outgoing chairwoman of the ICANN board of directors, at the conclusion of the unanimous vote. "This is a very important, first giant step for domain-kind."

In early October, ICANN received 44 valid proposals from organizations seeking to become registries of new top-level domains. Each proposal included one or more suggested top-level domains and was accompanied by a \$50,000 application fee. Many proposals offered multiple top-level domains, resulting in a pool of 191 options ICANN could choose from.

ICANN's 19-member board of directors selected the new top-level domains at a meeting

in Los Angeles that was open to the public and broadcast over the Internet. ICANN's board selected the new top-level domains based on the

The process was a draw for VeriSign, the sole registry for .com, .net and .org and the largest domain name registrar. VeriSign Global Registry Ser-

At the top

ICANN selected a broad range of international IT companies to register new top-level domains.

Domain	Applicant	IT companies involved
.biz	JV Team	NeuStar, Melbourne IT
.info	Afilias	Tucows and 19 registrars, including Network Solutions
.name	Global Name Registry	NamePlanet.com, IBM
.pro	RegistryPro	Register.com, Virtual Internet, Baltimore Technologies
.museum	Museum Domain Management	CORE Internet Council of Registrars Association
.coop	Cooperative League of the USA	Poptel
.aero	Societe Internationale de Telecommunications Aeronautiques	

Venture Capital, continued from page 86

an economic model to carry all that traffic," Geddis explains.

Although the 'Net's traffic patterns point to a fiber-optic future, not all fiber-optic start-ups will succeed, warns Cliff Higginson, a general partner with ComVentures. He says the best opportunities may be for component suppliers rather than bandwidth or system suppliers.

"In the optics business, the value is as much in the components as in the systems. It looks more like the PC business where the value is in Intel, and Hewlett-Packard and Dell are glorified value-added distributors," Higginson says.

In addition to fiber optics, venture firms also like wireless start-ups. For example, Every-Path, which provides Internet services over wireless devices and telephones, raised \$70 mil-

lion, and Ensemble Communications, which offers wireless broadband access, raised \$63.8 million.

"We like both mobile and fixed wireless. We believe they both have enormous growth potential," Spectrum's Collatos says. "On the fixed side, the challenge is simply getting the networks built. On the mobile side, the challenge is getting the networks built but also getting the applications built that can use the network to the fullest capacity."

Higginson favors carrier-grade wireless equipment, pointing out that the "infrastructure has to be dramatically upgraded for the carriers to be able to support mobile services."

Venture capitalists agree that investment in Internet infrastructure start-ups is good news for corporate IT managers.



If carriers don't keep up capacity, they'll lose customers to those carriers that do, says Chiaro CEO Ken Lewis.

"The long-term benefit is increasingly sophisticated networks with bigger pipes," Collatos says. "Enterprise customers are experiencing exponential growth in data distribution and consumption. They're looking to the future and saying: I'll forever need bigger and bigger pipes."

"Corporate users are going to be the big beneficiaries," Higginson adds. "With more companies being formed, the level of competition goes up, which provides a combination of lower prices and higher-performing services." ■

■ **"This is only an initial sampling of [top-level domains]...The ones that we selected represent a good mix."**

Esther Dyson, outgoing chairwoman, ICANN board

technical, business and financial strengths of the proposals, while trying to foster internationalization and competition in the domain name registry business.

Winners and losers

One big winner in ICANN's selection process is Register.com, which is involved in two winning proposals: .pro through a joint venture with Virtual Internet called RegistryPro; and .info as a participant in the Afilias consortium of 19 domain name registrars.

Other winners are NeuStar, which manages telephone number assignments in North America, and Australian domain name registrar Melbourne IT. The two companies formed a joint venture called JV Team that is involved with the winning .biz proposal, but the JV Team lost out on proposals for .iii for personal Web space and .geo for geographically referenced information.

vices teamed with Japanese telecommunications provider KDD Internet Solutions on .biz and .home, the latter of which was rejected. However, its Network Solutions registrar arm is part of the Afilias consortium.

Companies that weren't successful in their bids for new top-level domains include SRI International, Novell and Nokia. SRI's two proposals — .iii and .geo — were eliminated in the final round of debate. Novell proposed a .dir domain for directory services information, while Nokia proposed .mobile for routing messages to Internet devices.

"What we're concerned about is that this will become the next land rush," says Sarah Deutsch, vice president and associate general counsel at Verizon Communications. "People will run out and register names in the new domains, and the true owners of those names will have to pay exorbitant fees to get them back." ■

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I refuse to punch the monkey

Christmas is rushing toward us and so is the e-commerce onslaught. And you can bet that after the collapse of the dot-com world earlier this year this online season will be watched ultracarefully for trends, performance and growth. Which leads me to the topic of online advertising.

Despite the significant increase in online advertising expenditures this year, all signs indicate that the primary online advertising mechanism, banner ads, just don't cut it. Even Yahoo, after announcing earnings a few weeks ago, saw its share price fall because of the company's reliance on revenue from banner advertising.

Is this any surprise? Banner ads today are too numerous and generally too boring. I think it's interesting that over the past few years we've seen the average click-through rate (CTR) drop from a few percent to around 0.5%. Obviously the novelty factor has worn off, and consumers now perceive banner ads the way they see ads in magazines or, rather, the way they don't see them.

Consumers don't skip over banner ads because they're too small. On the contrary, full-banner and half-banner ads (defined by the Internet Advertising Board as 468 by 60 pixels and 234 by 60 pixels, respectively) dominate most pages, even at high screen resolutions. As soon as your average user sees a great, animated visual road bump at the top of a Web page he simply skips down to the real content.

So why don't Web sites use smaller, less-intrusive ads? If you talk to the advertising networks they'll tell you they only have a tiny inventory of the small ads. They claim advertising agencies aren't as interested in the smaller sizes, so they don't put as much effort into selling them. But wait a minute. They don't sell the smaller sizes, so of course they have no inventory

— can you say “vicious circle”?

And then there's all the talk about targeting ads to increase the relevance of what is being advertised. So far it seems to be just that — talk. The majority of ads I see are obviously not targeted at me at all. This is not surprising, as the advertising networks admit to delivering only a very small fraction of their inventory on a targeted basis.

All the studies of banner ad effectiveness show much the same things: the word “free” increases CTRs as does animation and controlled use of color. But even when a banner ad is well-constructed, it is still very similar to an ad you'd find on paper, and therein lies the problem — new medium, old thinking.

And the old media thinking is getting more prevalent as the Internet becomes more capable of delivering big content — look at the number of Web sites that now greet you with a flash presentation that is essentially a TV ad.

Of course, this sequence of static to animated banner ads followed by flashmercials is absolutely to be expected — it is an evolutionary process, and just because we have new media doesn't mean that old media thinking will be skipped as we come to grips with what can be done.

However, what we need to engage consumers in is commercial messaging (as opposed to “advertising”) that is “in context.” That means the message has to be related to the content and your interests.

How much of a mistake is it to advertise, “Punch the monkey” (which I refuse to do on principle) on a page discussing the benefits of an insurance policy?

I don't think we'll see anything different in online advertising this Christmas, and I doubt whether change will, or can, come quickly. But come it must because if it doesn't, those CTRs will just continue to plummet.

Advertise your thoughts to mvcolum@gibbs.com.



MARK GIBBS



The latest on the Internet industry

Carbonated carrot juice.

That's the best I could come up with on short notice when **Ideas.com** founder **Sanjay Goel** asked me to take a stab at fulfilling the **Coca-Cola Company's** request for a suggestion as to what might make a healthy new drink for kids.

So if you find carbonated carrot juice at your local grocery any time soon, you'll know three things: 1) who to blame; 2) that I'm \$5,000 richer; and, 3) Goel's start-up — one of a handful mining the so-called idea market — has a decent chance of catching on.

Here's how **Ideas.com** works:

Company A decides it needs help conjuring up a new whatever and is willing to pay a certain sum to see what ideas the hoi polloi might generate. In the Coca-Cola case, we're talking about a healthy children's beverage for \$5,000, but there are also \$5,000 bounties posted from **International Paper** for a process to make three-dimensional paper — whatever that means — and from **S.C. Johnson** to “reduce, prevent, or eliminate germs in the home.”

Someone will be awarded the money, so there is a contest element to the scheme.

The site also offers help for thinkers and tinkerers whose brainstorming do not fit neatly into the wish lists posted by those companies that participate as “buyers” on **Ideas.com**.

“All of these ideas are pent up in people's minds,” Goel says, “and until now they've never had a place to channel them.”

Big-time companies such as **Sears Roebuck** and **DaimlerChrysler** are willing to take a flyer on the unproven **Ideas.com** model because they are already shelling out huge dollars for offline methods of encouraging innovation. After all, what's five grand to Coca-Cola if carbonated carrot juice turns out to be the coolest thing since chocolate milk?

But that begs the question: Would \$5,000 be enough of an incentive — or enough of a reward — to get a serious inventor to part with a genuinely promising idea? Goel believes so, obviously, and he also notes that the buying companies are free to sweeten the deal once they've determined they've got a live one on the line.

Ideas.com intends to make money by charging the buying companies a straight participation fee and also collecting from them a percentage of the bounties paid to suppliers.

It's easy to see how **Ideas.com** would appeal to budding Edisons.

What's less obvious is how the site can generate enough transaction volume to support a viable business, although the number of companies sprouting up around this concept would suggest others do not share that concern. Among those offering services that are at least somewhat similar to **Ideas.com** are **IdeaExchange, Inc.**, **Ideadollar.com** and **BrightIdea, Inc.**

A word of caution: The **Ideas.com** site is plastered with legal mumbo-jumbo, which presumably does a better job of protecting the buyers than the sellers.

If you scanned the dot-com obituaries last week you may have seen the death notice for **Streamline.com**, an online grocer based here in Massachusetts. This columnist read the news with more than his usual professional disdain for a misguided business model, because . . . well, because this particular stinker of a stock was in my personal portfolio.

How could someone who makes a living making fun of B-to-C dot-coms have fallen for such a shaky investment?

This is America, so naturally it wasn't my fault. An analyst for the name-brand brokerage house I entrust with my spare change had predicted **Streamline** would hit \$40 within a year when I bought a small amount at \$7 per share back in February.

In other words, I let greed get the better of my best judgment.

Condolences and smug rejoinders should be sent to buzz@nw.com.



PAUL MCNAMARA

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is coming.

Staple
Saddle Stitch
Hole Punch

Out with the old, and in with the new digital imageRUNNER 5000 and all it has to offer. Like the ability to seamlessly connect to any network. To output documents at 50 ppm and deliver full-finishing capabilities -- right from the desktop. Plus, it's built on the highly acclaimed imageRUNNER product platform. So, put a fresh coat of paint on the walls, something new is headed your way. At Canon, we're giving people the know-how to realize the full power of the digital office.



imageRUNNER™
5000

Canon KNOW HOW™